IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication AUGUST 18, 1960

Jim McHale

[illegible] Quick-Change Tooling Packages Mark—

A New Concept in Lathe Design p. 99

★ **Three New Weekly Features:**

- **Business Forecast** p. 7
- **Metalworking Labor** p. 9
- **International** p. 13

MESTA
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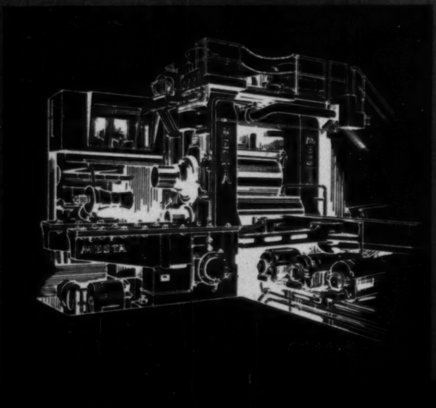
MESTA 56" Four-High Hot Strip Mill for Rolling Stainless, Silicon, High-Alloy, and Carbon Steels at the Brackenridge Plant of Allegheny Ludlum Steel Corporation

HOT STRIP MILLS

Designed and Built by
MESTA

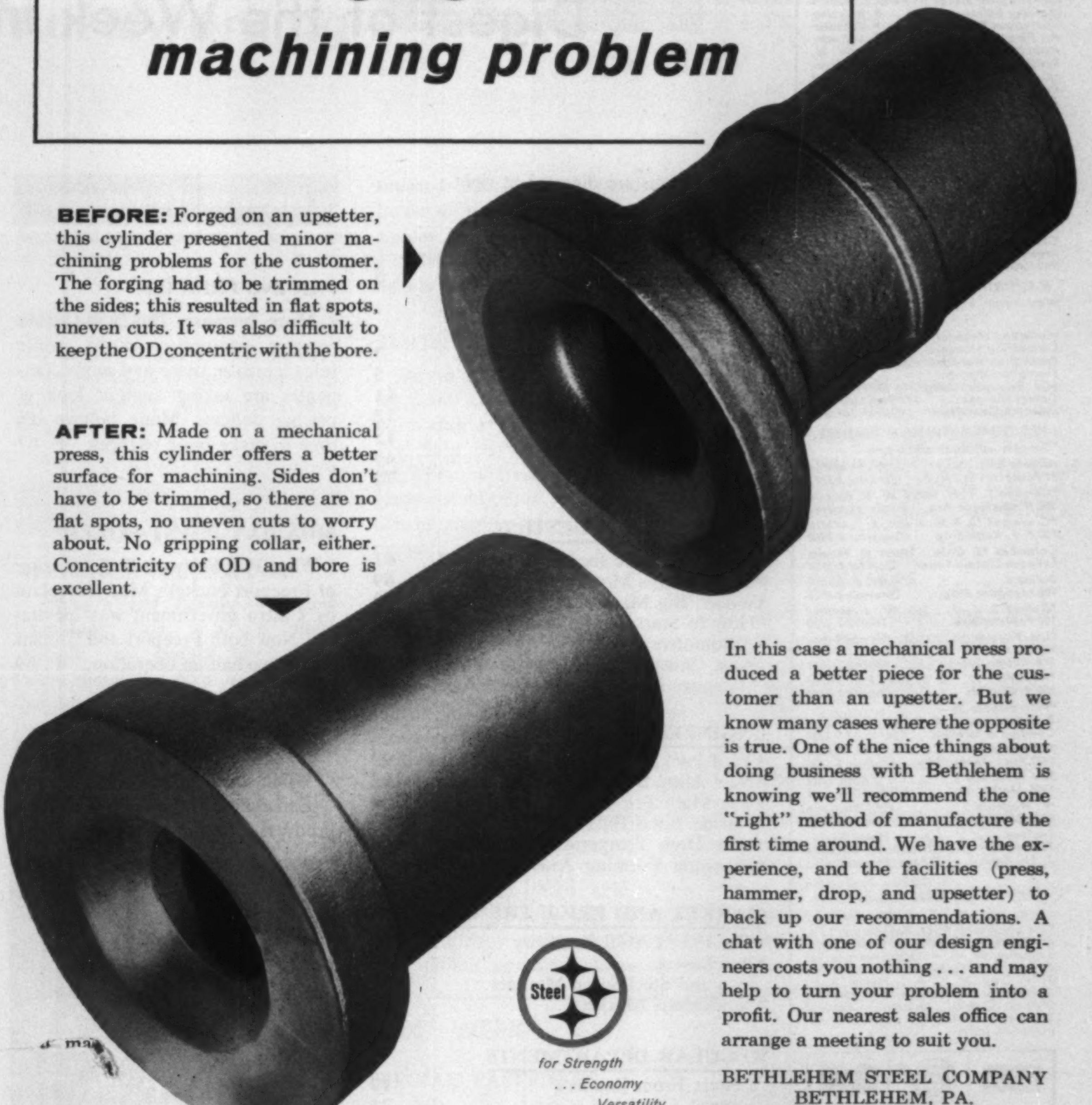


Designers and Builders of Complete Steel Plants
MESTA MACHINE COMPANY
PITTSBURGH, PENNSYLVANIA

The redesign of this forging solved a machining problem

BEFORE: Forged on an upsetter, this cylinder presented minor machining problems for the customer. The forging had to be trimmed on the sides; this resulted in flat spots, uneven cuts. It was also difficult to keep the OD concentric with the bore.

AFTER: Made on a mechanical press, this cylinder offers a better surface for machining. Sides don't have to be trimmed, so there are no flat spots, no uneven cuts to worry about. No gripping collar, either. Concentricity of OD and bore is excellent.



In this case a mechanical press produced a better piece for the customer than an upsetter. But we know many cases where the opposite is true. One of the nice things about doing business with Bethlehem is knowing we'll recommend the one "right" method of manufacture the first time around. We have the experience, and the facilities (press, hammer, drop, and upsetter) to back up our recommendations. A chat with one of our design engineers costs you nothing . . . and may help to turn your problem into a profit. Our nearest sales office can arrange a meeting to suit you.

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Indexed in Applied Science & Technology Index and Engineering Index.

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THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Second class postage paid at Philadelphia, Pa. Price to the metalworking industries only or to people actively engaged therein. $2 for 1 year. $3 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $25; other Foreign Countries, $35 per year. Single Copies 50¢. Annual Review Issue $2.00. Cable: "Chilton," Philadelphia

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August 18, 1960—Vol. 186, No. 7

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MOA BAY PLANT SEIZED

What Will Freeport Do?—Seizure of Freeport Nickel's Moa Bay plant by Castro government was inevitable. Now both Freeport and Cubans each have half an operation. P. 69

WOOD: MARKET FOR METALS

Wood Products Demand Grows—Expanding market for forest products also creates demand for metalworking products used in lumber and wood industries. P. 70

MANUFACTURE ABROAD?

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Metalworking

Cover Feature

CRANKSHAFT LATHE—

Package tooling, by the R. K. LeBlond Machine Tool Co., creates a hybrid lathe. R. E. LeBlond, president, puts it through a check run for his top engineers C. Ruehrwein and H. Kemper. P. 99

A. Scott of the Chase Manhattan Bank tells of the "do's and don'ts" for companies planning to invest in W. Europe. P. 72

AUTOMOTIVE

Luxury Cars—Automakers haven't written-off their plush models. They don't think buyers have either. P. 81

Engineering-Production Developments

ALUMINUM DIECASTINGS

Strength and Beauty — A new aluminum alloy, which offers strength and beauty to finished parts, opens the door to high-production diecasting. Machinability of the new alloy is good. Color anodizing, brazing, welding and porcelain-enamel coatings can be handled on a production basis. P. 102

MATH APPROACH

Improves Machining — Calculation of optimum cutting speeds can be easy. A new high-efficiency program shows how. It pinpoints the balance between time cost and tool cost. The new method considers all vital machining factors: tool life, cutting speed, output, labor, overhead and tool costs. P. 104

NITRIDE BOND

Fills Ceramic Gap—Silicon-carbide refractories have great industrial potential. But due to weak bonds, this potential hasn't been realized. Silicon-nitride bonds may be the answer. They resist corrosion caused by fused salts. Heats up to 1250°C strengthen a new ceramic's nitride bonds. P. 107

SYNTHETIC LUBRICANT

Serves at 1000°F—A compound lubricant consists of a synthetic fluid and a lubricating thickener. The fluid carries the thickener to the lubrication area. At 500°F, the clean-burning fluid volatizes. A soft film of graphite-based lubricant remains. P. 108

PRECISION CASTINGS

Provide Design Freedom — Investment castings form shapes to tolerances of ±0.005 in. per in. Follow-up actions hold critical dimensions to ±0.001 in. P. 110

Market and Price Trends

WEST COAST

Kart Markets—California is the heart of a growing kart business that is already seeing revenues of $40 million annually. More than 300,000 karts are now in use around the world and an additional 200,000 are expected to be purchased next year. P. 82

STEEL SUMMARY

Gloomy Outlook—The expected upturn in steel operations is set back again. Current orders are even slower than two weeks ago as mild upturn then failed to gain momentum. September outlook is now little better than August. P.137

FOUNDRY SALES

How Clinics Help—Sales effort in the foundry industry wasn't paying off in maximum results. So foundries used clinics to help remedy the situation. P. 138

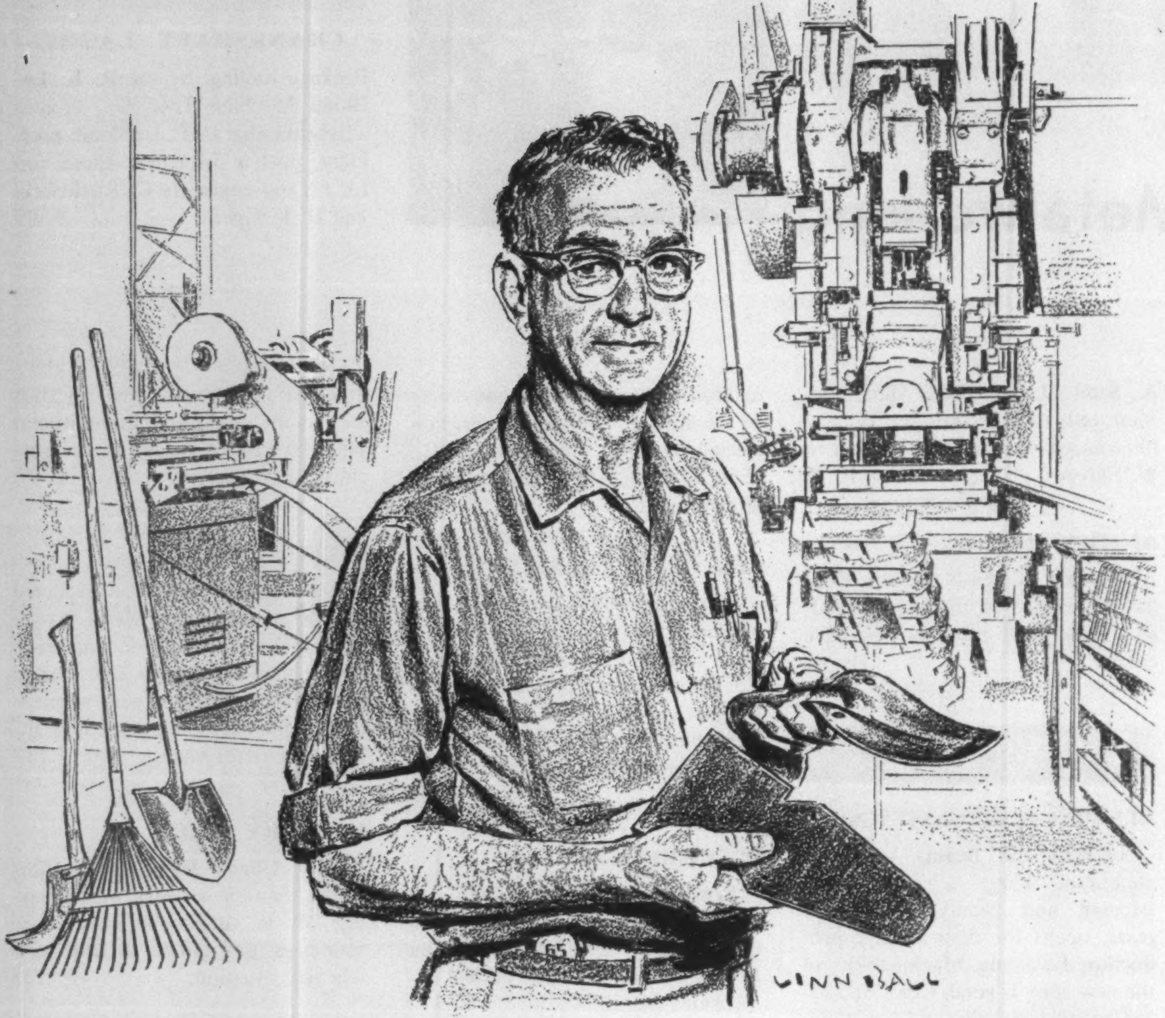
NONFERROUS

Threat in Congo—Leaders of Katanga province in the Congo say the area's mineral wealth is in danger. If present technicians are forced to leave, mine operators may be forced to turn to Russia for technical assistance. P. 146

NEXT WEEK

SPECIAL FASTENERS

A Growing Field—Special fasteners, custom-made and proprietary, can cut your production costs. In next week's issue, a 16-page feature will examine this timely subject from the standpoint of design, purchase and application.



"All Things Considered, You Can't Beat Sharon Steels and Service"—DAVID H. PARKER, Assistant Foreman Sheet Metal
Saybrook Plant, True Temper Corporation

"At True Temper we make hundreds of different items for gardeners, craftsmen and sportsmen," says David H. Parker, assistant foreman, sheet metal. "Because of this we buy many different steels—from plain hot rolled carbon to special analysis stainless. We buy from several different steel producers, so I speak from experience when I say some of the finest quality steel I have used in my 20 years in the metalworking business has come from the *Sharon Steel Corporation, Sharon, Pa.*"

SHARONSTEEL **SHARON** *Quality* **STEEL** Steel

EDITORIAL

Peace With Strength: It's Our Only Salvation!

Our nation has faced some tough problems in the past. But over the next several years the international challenges will be fantastic in their complexity. Of course we will meet them. But it will be far from easy.

We are in trouble everywhere. We must regain our past friendliness with South American nations. It will not be easy. It will take many more dedicated and knowledgeable men in the State Department.

The difficulty of remaining upright in the African situation will not disappear. We will have to do a little more active and specific supporting. We can't ride two horses at the same time. We will have to learn just what diplomacy really is. The "new" kind must live with and measure up to the African potential of pain, disappointment, and a long hard fight towards governmental and individual responsibility in the various African nations.

World events are moving so fast they take your breath away. Age-old ideas of integrity, honesty, and freedom are fine—always. But those who hang on to older ways of doing things may be in for some rude awakenings. Both Presidential candidates know this better than, or as well as, their supporters do.

America no longer can guess, wish, or assume that it is the strongest nation in the world. It must, from here on out, be the strongest—with no room at all for argument as to whether it is.

We now have to be ready for a nuclear war. We must be ready for a limited war or a police action. If we are not, we may lose large hunks of the uncommitted world to communism. That is not a pessimistic possibility, it is a cold-blooded probability.

The only thing that keeps the Russian and Chinese Reds from moving in on other parts of the world is the strength of the United States and her allies. Without dilly-dallying, we must become a fully-armed America—but not a garrison state. That won't be easy.

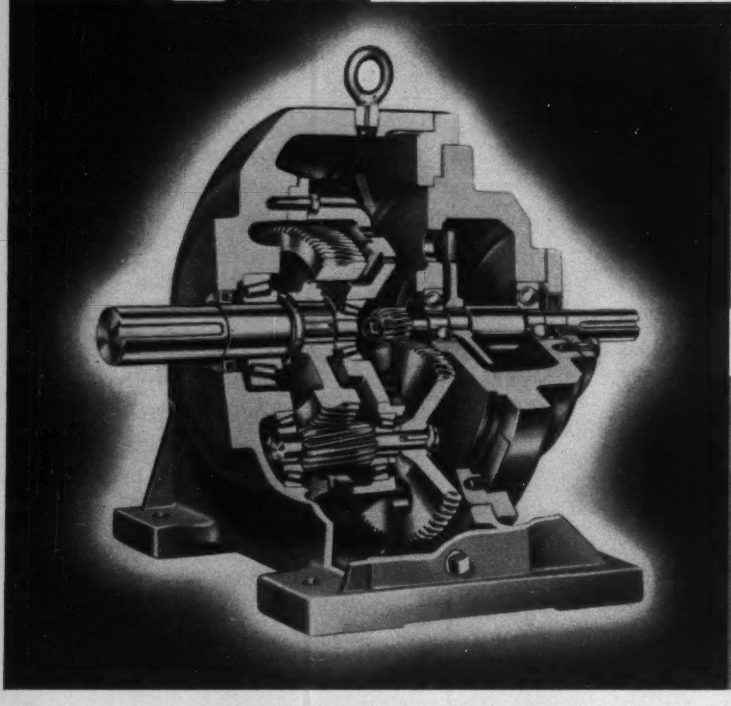
We must maintain a thinking and acting economic barrage here and abroad to support, expand, and confirm the strength of the Free World. In order to do this, we may have to experiment. But in that event, let us not lose sight of the main fact: We can't establish a dictatorship to fight a dictatorship!

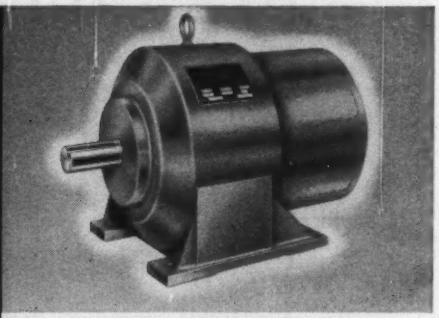
Tom Campbell

Editor-in-Chief

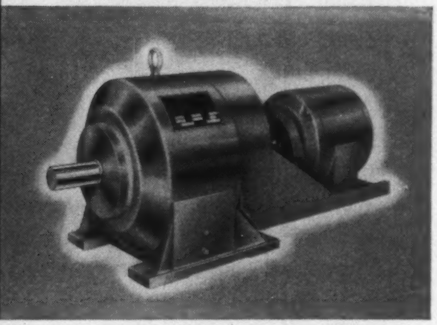
"Buying at Philadelphia Gear, I get the benefit of this simple formula..."

IMPROVED GEARS = {LONGER LIFE / MORE POWER}





Available as "IN-LINE" Reducer (left), or as a GearMotoR with flange mounted motor (above) or foot mounted motor (below).



The gearing in these drives is case hardened and precision ground, an advanced development that out-dates conventional standards and ratings. You get commercial drives with gearing of master gear quality at a cost no greater than conventional drives now in use. They are available in standard sizes to 200 H.P.

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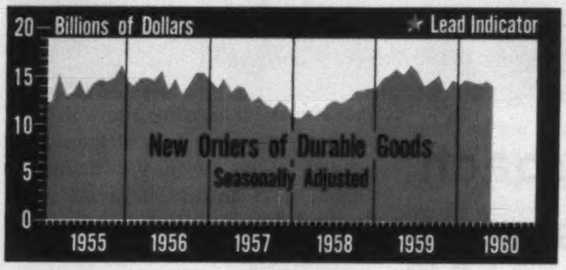
How Serious Is the Dip?

There is no depression in sight. But there is a recession in steel. There may be a moderate dip in the overall economy later on this year as its effects spread. For the moment, international tensions and the prospect of increased defense spending rule out a severe recession.

The pattern looks like this: A slowdown this fall, continued sluggishness through the winter, followed by signs of a recovery in the spring of 1961. A strong upward movement should be under way in the second half of next year.



Durable Goods Orders Bottom Out

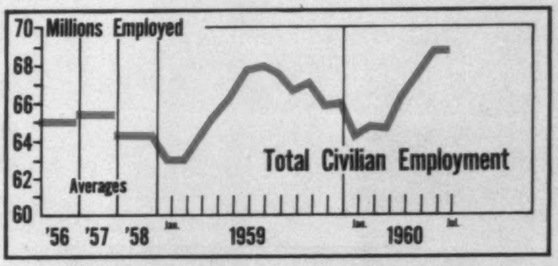
June orders for durable goods industries, down from $14.7 billion to $14.2 billion, will not mark the end of the decline. With July steel sales off and with many plants shut down for vacations, new order figures will show further declines when tabulated for July. Some pickup may be expected this month.

Second Half Prospects

Most forecasts for the second half inevitably turn to consumer spending. Capital spending and defense show no short-term surges. Spending for durables has not been much to cheer about and continues to be the key factor in the second half. Spending for nondurables and goods and services continues to climb and is the stabilizing factor in overall business now.

What First Half Earnings Show

The decline in first half profits raises more doubts on second half earnings, where the outlook begins to look bearish. A survey by the First National City Bank of New York indicates first half profits are down 4 pct from 1959's first half. The bank now expresses doubts "whether business profits, after taxes, will make the grade."



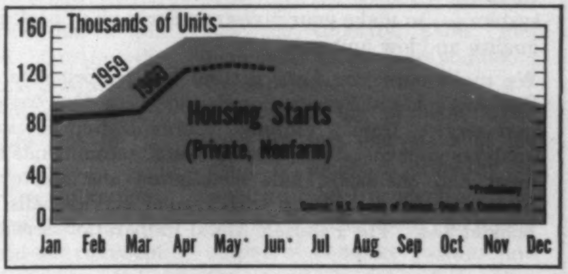
Employment Reflects Mixed Trends

Mid-summer employment figures reflect mixed trends. Total number of jobholders rose 110,000 from mid-June to mid-July to a record 68.7 million. Unemployment dropped by some 400,000 to 4,017,000, This is about 5.4 pct, down from the previous month's 5.5 pct. However, increases in new jobs for teen-agers counterbalanced increased unemployment in durable goods.

Construction Outlook Good

Construction contracts let in the first half indicate a substantial second half rate of building is assured. F. W. Dodge Corp. reports that construction contracts for the first six months reached the second highest first half total in history. Conclusion is that 1960 will be a good year for the construction industry, although "not likely to be a record-breaker."

Items: Contracts for commercial buildings were almost the same as the record first half of 1959. Largest dollar volume gain is reported for schools. Weakest sector: residential building.



Will Housing Starts Pick Up?

Housing starts are expected to rise because of easier money. But it won't come automatically. At present, they are at little more than a 1.3 million annual rate. Last year, the rate was higher, at about 1.5 million. Most experts now believe the new increase will not be under way until next spring. But the rise can continue to a possible record in 1962.

making appliances?

Pennsalt system approach makes finishing dollars go further

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USWA: Between Campaigns

When the Dept. of Labor's study on steel industrial relations comes out late this year, it promises to keep alive the issues between the union and the steel industry.

At least, it will be a conversation piece for months to come. Both sides will come in for sharp analysis. Prices, always a sore point for the industry, will rear their heads, even though the major reason for the $150,000 study is to research the history of steel labor from 1936 to date.

Meanwhile, interest in steel labor is turning toward the next election of union president. As it stands now, David J. McDonald is much surer of his election than is either of the national presidential candidates.

Guessing is that the union president will be returned, but that there will once again be a 33 to 40 pct protest vote.

GE on Productivity

General Electric's recent "white paper" on productivity is considered by the company to have long-term significance as a basis for relating wages to efficiency increases. GE contends real productivity is much less than indicated by government indexes of output per man hour.

The company goes into questions of worker contribution, short-term spurts in productivity and variations from industry to industry.

Fringes: How Costly?

Fringe benefits are high and climbing rapidly. A U. S. Chamber of Commerce survey indicates that employes (from a sample of 1064 big and little businesses) received an average of $1,132 in fringe payments in 1959. In 1958, the figure was $981.

According to the survey, fringe benefits and related payments hit 22.8 pct of total payroll costs. The breakdown, taking fringes as equalling $22.8 out of each $100 in payroll costs: $4.20 for legally-required payments; $7.20 for agreed-upon benefits, such as pensions; $9.60 in payments for time not worked, such as vacations and holidays; $1.80 for profit sharing and similar payments.

Communications Pays

New rules for industrial communications may be set by the recent agreement of Pittsburgh Steel Co. and the USWA. According to officials, the company's success in explaining its problems was due in a large part to: Complete candor in presenting financial facts to workers; and personal visits by foremen to homes of workers.

Organization Drive Stalls in Philadelphia

First test of the AFL-CIO's "Philadelphia pattern" organizing drive in smaller companies has resulted in a failure. Sixty-one workers at an aircraft-equipment company outside Philadelphia rejected a bid to join the UAW by a vote of 51-10.

This was the initial voting in the first large-scale industrial organizing effort conducted by the AFL-CIO in the last five years. The immediate target: 87 unorganized plants in the Philadelphia area. If the Philadelphia campaign is successful, the drive will be extended to other cities. Included in the organizing drive are UAW, USWA, IUE, and Machinists.

UAW: Ford Plans Abroad Hit

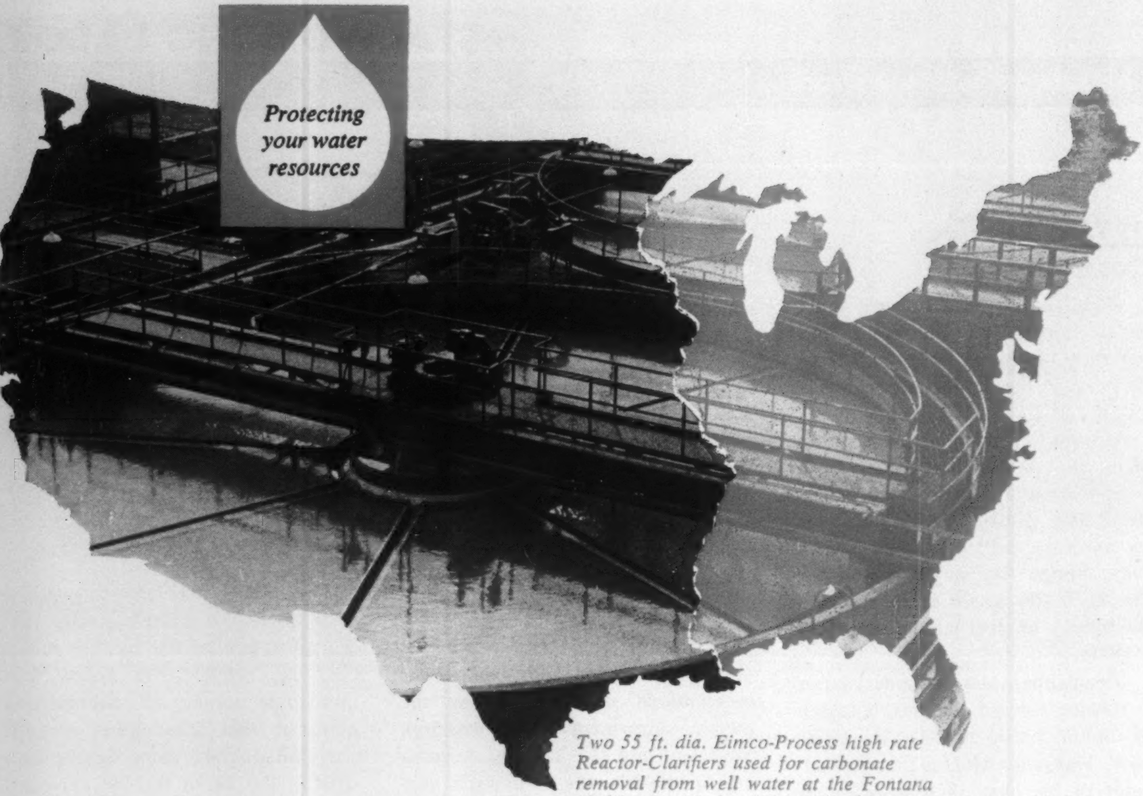
The United Auto Workers are up in arms about reports that Ford Motor Co. will produce a small car abroad. What aroused the UAW: Stories that if the Volkswagen-sized car in the works at Ford is produced, it will not be at the giant Rouge plant, or anywhere else in the United States.

Instead, according to rumors, it will be turned out in W. Germany. Ford did not comment on the issue, at least immediately. But the stories fed on the company announcement that it will spend $1 million in Britain for 1961 Falcon parts. (See International, p. 13).

Ford Local 600, largest single local unit in the U. S., has been extremely vocal in the past year about declining employment at the Ford Rouge plant in Dearborn. Union leaders say the plant has the capacity, skills, and manpower to produce additional Ford models.

Much of the problem arises from the fact that much of the plant is involved primarily in standard-model production. This has been reduced by increased output of compact Falcons and Comets which are made in other plants of the decentralized Ford empire.

The union is now plotting its next move, warning that unless Dearborn's employment problem is solved, it will be a factor in the next contract negotiations.



Two 55 ft. dia. Eimco-Process high rate Reactor-Clarifiers used for carbonate removal from well water at the Fontana (California) Works of Kaiser Steel Corp.

East may be East and West may be West, but fortunately for us, both Eastern and Western steel mills have a mutuality of interest in water treatment.

In the East, mills are primarily concerned with recovering flue dust from waste waters so it can be returned as a raw material. Coincidentally, they wish to make the waste waters conform to stream pollution abatement standards. In the West, flue dust recovery is also important, but with water being precious, primary emphasis shifts to conditioning water for process use and then recovering the waste water for reuse.

Happily, the Eimco-Process Reactor-Clarifier is at home in either environment. Basically a mechanism that combines flocculation, sedimentation and clarification in a single tank, it has a number of possible design variations and optional features to permit chamelion-like adaptation to strictly local conditions.

For example, at Kaiser Steel Corporation's Fontana (California) Works, eight Reactor-Clarifiers are engaged in a variety of water treatment operations. Some are removing calcium hardness from well water to make it suitable for the steelmaking process. Others are clarifying and recovering gas washing wastes. Still others are used to neutralize acid liquors in the tin mill wastes. All are delivering a final water well below the minimum required turbidities.

One conclusion can be drawn from such an exhibit: if you have a water treatment problem . . . in a steel mill or a sewage treatment plant . . . East or West . . . a system built around the versatile Eimco-Process Reactor-Clarifier will serve you well. For more "how" details, please contact any of our nationwide sales representatives.

THE EIMCO CORPORATION

Process Engineers Division
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By R. W. Crosby

Politics Causes Defense Shifts

Defense spending, which looms as one of the biggest political issues of the 1960 campaign, has turned Democrats and Republicans inside out.

Actually, all of these defense spending shifts and maneuvers are politically inspired. The money everyone is talking about is for this fiscal year—July 1, 1960 to June 30, 1961. If there really is a need for more defense money, the next Congress can take care of it.

But right now, Kennedy-Johnson coalition Democrats, who voted $750 million extra for the military and promised to go for $2 billion more in this rump session, have now stopped trying for big military increases.

But the Administration, which said it would not spend the extra $750 million, now says it will spend some extra money and ask for more if needed.

The Democrats' strategy is to say there's no use in appropriating more defense money because Ike will only put it on ice. They hope this attitude will indicate Republicans are apathetic about defense.

But Ike beat them to the punch. He said he will spend some of the extra on several projects (the B-70 bomber, the Samos spy satellite, more Polaris-firing submarines, a new airlift plane, and Army modernization). He will ask for a "modest increase," if necessary.

Regulation Reform

Sentiment for sweeping reforms of the present Federal regulatory agency system grows in Congress. The movement is an outgrowth of the past couple of years of influence-peddling probes by lawmakers.

First major action will be laws setting stiff fines and jail sentences for "off-the-record" attempts to influence decisions. Later, basic changes in the methods and powers of these agencies are possible.

Tight Check On Tax Returns

Internal Revenue Service agents, armed with tax records, are making a block by block, business by business, tax compliance canvass. They are checking the nation's businessmen to see if all tax returns are being filed.

The IRS "Returns Compliance Program," aimed at tax enforcement and taxpayer education, first lets the businessman know what taxes he must pay and then makes sure he pays them.

Several million dollars in added tax revenues, mostly from lawyerless small businesses, is expected when the three to five-year canvass is completed. Many small businesses don't realize they must pay several different taxes, such as: Business income tax, employer's social security, withholding tax, and excise taxes. They will soon realize it, under revenue agent scrutiny.

Defense Waste

The Defense Dept. continues to be criticized for wasting money. Latest charge — denied by the Pentagon—is that the military committed a $147 million blunder by constructing thousands of unneeded houses for officers and enlisted men.

The General Accounting Office, which oversees government spending, said the Army, Navy and Air Force built or programmed for construction 5,900 houses "in excess of actual or apparent need."

This is more fodder for congressional horsemen who want to legislate a tight reins policy on Defense Department spending. They will try to get a grip on the reins next session.

Kennedy Pushes Picketing Bill

A labor-backed bill to relax picketing curbs, which seemed like a dead issue a few weeks back, is very much alive.

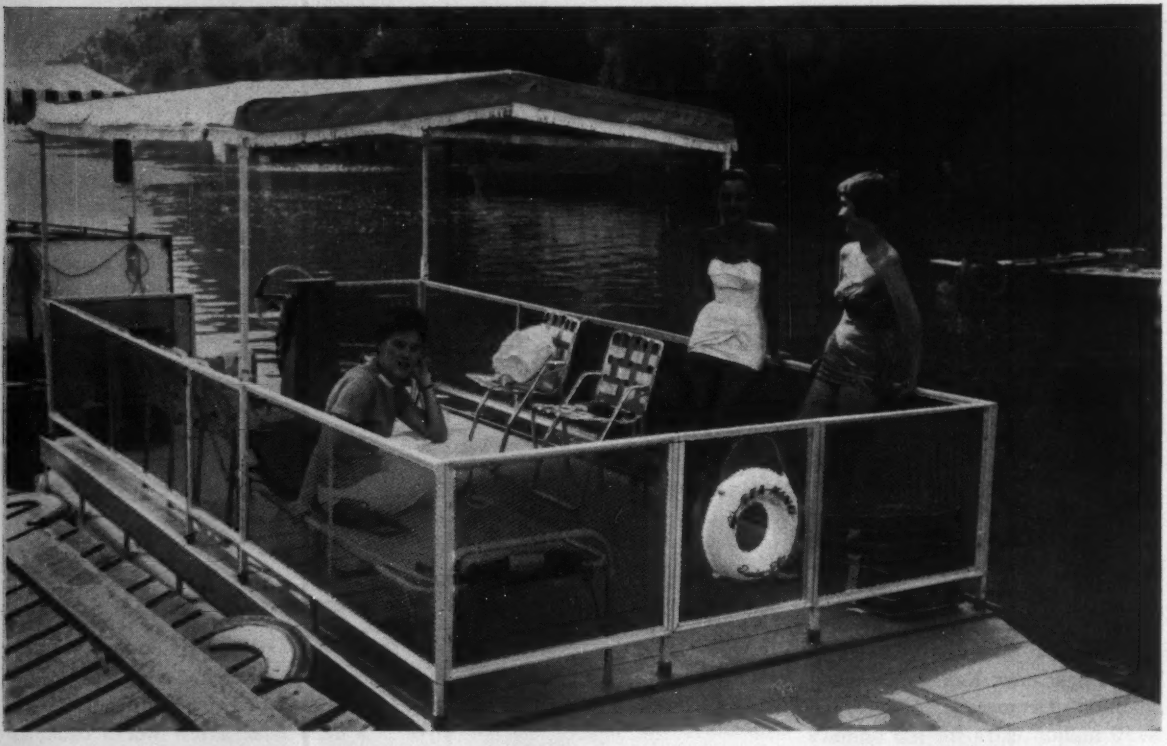
Democratic Presidential nominee Sen. John F. Kennedy apparently is determined to keep a promise to labor. He'll try to push through legislation permitting now illegal common site picketing in the construction industry.

Sen. Kennedy's Senate Labor subcommittee gave the bill its first push toward passage last week over the howls of conservative opponents. But these conservatives, Southern Democrats and Republicans, will have their say before the voting is through.

Steel Worries Ike

President Eisenhower isn't worried about the nation's economy. But he does believe declining steel production is an obvious weak spot.

To a news conference question about the possibility of an economic recession, he conceded that steel production was down, but he blamed this on "hysterical" production before and after the 1959 strike. He said the economy cannot absorb all the steel which can be produced at this time.



Penmetal expanded metal helps you sail with security on this versatile pontoon boat

In designing and building the "Twin-Flo" pontoon boat, Modern Welding Company has placed the emphasis on comfort . . . and safety. That is why Penmetal expanded metal was chosen for the railings and gates.

Strong, yet light in weight, this diamond mesh provides superior security for those on board, without adding significantly to the over-all weight of the vessel. Expanded metal has the rigidity to span large areas in an unbroken sweep; the stamina to withstand the abuse of every day use. What's more, it adds much in the way of appearance, having that simple, functional look typical of good modern design.

Perhaps one or all of the qualities mentioned above can be applied to your product through the use of Penmetal expanded metal. Catalog 521-EM will help you select it. Send for a copy today.

Comfort and safety afloat, by Modern Welding Company, Owensboro, Kentucky.

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Plant: Parkersburg, W. Va.
District Sales Offices: Boston, New York, Philadelphia, Pittsburgh, Chicago, Detroit, Dallas, Little Rock, Seattle, San Francisco, Los Angeles, Parkersburg, St. Louis

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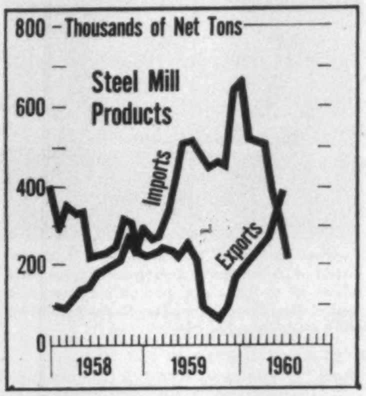


Steel Exports Gain

Exports of steel from the U. S. are reversing the trend and gaining on imports.

June exports totaled 382,000 tons, the highest monthly export since October, 1957. At the same time, imports totaled 213,000 tons. It is the second consecutive month for which exports exceeded imports. Imports had been higher for 17 consecutive previous months.

Cold-rolled sheets and tinplate accounted for most of the increase.

But for the first six months, imports still have the edge. Imports through June totaled 2.2 million tons against 1.5 million tons exported.

If the trend continues, there is a possibility of a favorable balance of trade in the steel industry this year.

Entire Soviet Bloc Joins Economic War

It isn't generally realized that the entire Communist bloc is organizing its industry to increase its potential for economic war against the Free World.

"Harnews," a business newsletter published in W. Germany, reports a recent meeting of Communist nations in Budapest came up with a 20-year plan for "Socialist division of labor." Basically, it means each Soviet satellite will increase production of items which it makes best at lowest cost, with less emphasis on other items.

But not all the satellites are overjoyed. To some, it threatens to put their own economies out of balance and slice their gross national product.

Dr. FIDEL CASTRO

Castroism: It Means Years of Trouble

For some time, realistic businessmen experienced in the crosscurrents of Latin America have realized there is no easy way out of current troubles. Castroism has revived too much ill feeling toward the U. S.

The new plan for Latin American investment by the U. S. is a good plan. But in the minds of many South Americans, it is too little too late. At the same time, it must be realized that the old cliche of better late than never has to take precedence.

It would be far from the facts to believe that there will be any letup in difficulty in relations with Latin American countries. The emotionalism generated by Castro won't disappear over night.

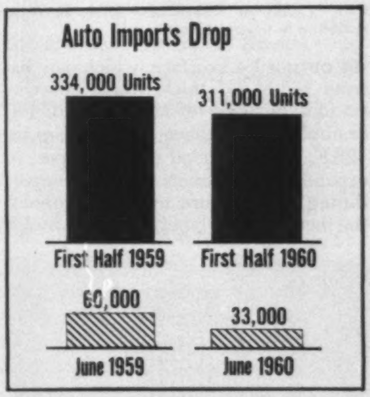
Ford Looks Overseas

British auto parts makers are getting ready for $1 million worth of business with the Ford Motor Co. next year. That's the amount Ford will spend in Britain for 1961 Falcon components.

Parts include leaf springs, steering wheels, clutch release bearings, and wiring. Ford says the order is in keeping with its policy of establishing relations with many suppliers and buying on a competitive basis. (See Metalworking Labor, p. 9)

Tariff Troubles

Foreign trade experts in Washington are saying the U. S. has little chance of coming out of the international tariff bargaining at Geneva, Switzerland, with enough foreign tariff cuts to reverse this country's present huge balance-of-payments losses.



Auto Imports Drop

Imports of foreign cars into the U. S. dropped 7 pct in the first half of 1960 from the same period a year ago. Last year, imports totaled 334,000 cars in the January-June period. This year, the figure was 311,000.

More significant, June's total of 33,000 imports was the monthly low for 1960. Earlier monthly counts: January, 48,000; February, 64,000; March, 65,000; April, 55,000; May, 46,000.

ANACONDA CONDENSER AND HEAT EXCHANGER CLINIC

"Cupralum," lead-surfaced Anaconda copper tube, offers practical answers to some tough corrosion problems

If you'd be interested in more compact, more economical heat transfer units for handling corrosive liquors — sulfuric, chromic, phosphoric acids, sulfites, sulfates, alum, and the like — you should know about Cupralum*. Cupralum, a product of Knapp Mills, Inc., is Anaconda copper or copper-alloy tube to which a uniform, dense-structured, extruded chemical lead surfacing has been metallurgically bonded.

Alfred P. Knapp, chairman, Knapp Mills, Inc., explains to visitors how his company's patented drawing process metallurgically bonds lead surfacing to copper tube.

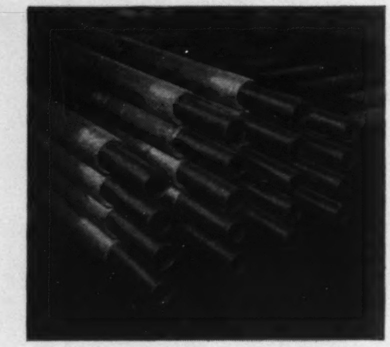
THE OUTSIDE lead surface, which may be from ⅛″ to ½″ thick, resists concentrations of acids—of sulfuric acid, for example, up to about 85% and up to 428 F. Being bonded to the copper, it expands and contracts with the copper during temperature cycling. Without the metallurgical bond, the lead would creep and eventually fail—an inherent weakness of all-lead tubing.

Two U-bend Cupralum tube bundles like this are used in a Ferrolum (lead-surfaced steel) separator tower to boil off ammonia from a urea carbonate ammonia solution—in the production of urea fertilizer. Anaconda copper tube core 1" O.D., 12 gauge, handles 150-lb. steam. Lead surface is 3/16 inch thick. Separator tower operates at 145 C (293 F) and 240 psi.

THE COPPER or copper-alloy tube inside provides strength to make Cupralum self-supporting — and to stand steam pressures up to 150 psi in standard wall thicknesses offered. It also provides its high corrosion resistance internally to cooling waters, steam, and refrigerants.

Most important, copper offers its high heat transfer rate. Because of the metallurgical bond with the lead, the over-all heat transfer rate of Cupralum is high—higher than all-lead tube and higher than that of iron and steel.

THE NET RESULT is that a given heat transfer job can be done with fewer square feet of surface — for a more compact unit. Or it is possible to get increased capacity in present existing space.

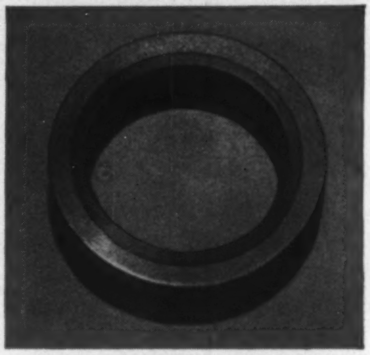


Lead surfacing removed from ends of Cupralum tubes preparatory to insertion in lead-clad steel tube sheet. Tube ends are usually rolled, but for severe thermal cycling service, may be brazed to outer steel face of tube sheet.

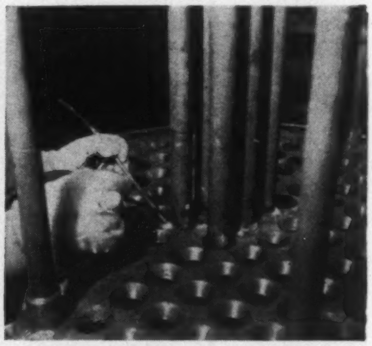
In many cases, the first cost of the coil is lower. Usually this is true where higher steam pressures than those previously used are available—or where expensive, hard-to-fabricate alloys have been used. Improvement of the heating or cooling cycle is another source of savings. Under any circumstances, a long operating life and easy maintenance provide over-all economy.

NUCLEONIC APPLICATIONS. Cupralum with a thicker surfacing of lead is being used increasingly in the nuclear industry. For gamma shields that must be cooled, Cupralum coils are built in to provide efficient heat transfer from the shield to the cooling medium.

Where radioactive liquors and spent resin discharge from demineralizers must be conveyed through process piping into process vessels for concentrating the radioactive solution, Cupralum piping prevents the escape of gamma radiation. In nuclear applications, the lead surfacing may be 1″ to 8″ thick.



Cutaway section of Cupralum tube. It is produced in 20′ lengths or in long continuous coils —from 40′ to 100′ depending on diameter. It is easy to bend and fabricate. Reliable jointing techniques have been developed.



Lead surfaces of Cupralum tubes and of tube sheet are fused by lead-to-lead welding. Then an extra thickness of lead is applied at the joint for extra protection.

FOR MORE INFORMATION. For detailed data on Cupralum, write Knapp Mills, Inc., Wilmington, Del. Or see your Anaconda representative, who can also provide data on the full line of Anaconda copper and copper-alloy tubes—arrange for technical assistance in meeting special corrosion and heat transfer problems. The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 6071

*Registered trademark of Knapp Mills, Inc.

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TUBES AND PLATES
FOR CONDENSERS AND
HEAT EXCHANGERS

Made by The American Brass Company

Grinders Go Production

Look for surface grinding to move out on the production floor. Key to the development—use of surface grinding for stock removal—is a quick tilting head. These machines are beefed up structurally and have up to 125 hp per spindle. Early tests show handling and setup are minimized.

Vanadium Butters Joints

The use of vanadium metal as a butter between titanium and steel counters the usual problem of welding dissimilar metals. Called inlayer welding, this technique uses either a series of vanadium plugs or a thin continuous sheet. Vanadium also provides the necessary engineering strength and corrosion resistance at the joint.

Epoxy Ends Vibration

New potting and protective coating methods for computer sub-assemblies have been developed by Librascope Div., General Precision, Inc. Epoxy resin is used as the protective material. It can be sprayed or dipped at room temperature and then set at temperatures low enough to prevent damage to the sensitive parts, such as—diodes, resistors and capacitors which make up logic card circuits.

Machine Tooling Packaged

Unique new idea in machine design is to package the components and tooling that make the unit a "special." The package can be readily lifted or replaced with another package for other sizes of the same part—or even different parts. It's a move aimed at cutting capital cost of production machines, as well as making the units more flexible and efficient.

New Plating Process

A new method of plating metal parts for corrosion protection eliminates the hydrogen embrittlement problem in plating high-strength steels. The process is called, mechanical plating. A promoter chemical, an impact media and the specially prepared plating metal in powder form are tumbled in a rubber-lined barrel. Water and spent chemicals are drained into sewers without need of treatment. Plating thickness is controlled by the amount of specially prepared metal powder added to the tumbling barrel.

Reclaims Germanium Scrap

Using a specially designed solid-gas reactor, High Purity Metals, Inc., Hackensack, N. J., has developed an automated process for low-cost reclamation of high-grade germanium scrap. The company is reclaiming on a toll basis or supplying on a scrap credit basis. Semiconductor makers can obtain ingots tailored to their needs up to lengths of 20 in.

Resin Takes Liquid Form

Look for polyethylene to take on added uses. A new process for liquefying the resin and keeping it liquid without heat was perfected by Dr. Rene Kales of Martial & Co., New York. Blending polyethylene with urethane, a well known coating material, produces greater elasticity, acid resistance and improves dielectric qualities.

Offers Many Corrugations

Metalworkers at one company are using a new concept to form corrugated metal shapes. Key to the process is a special machine with cam-controlled action which moves its dies in both vertical and horizontal planes. Many variations in patterns, materials, gages and dimensions point up diversity of design concepts possible. The process handles structural metals such as aluminum, brass, copper, stainless steel or regular steels.

New Fingers Hold Bearings

Tooling damage, inventory and maintenance costs have been reduced by redesigning the fingers for a cold forming machine. The cold former is a transfer machine that upsets slugs of steel into tapered roller bearings. One set of fingers now handles all roller sizes. Designed with a pivot plate, they automatically grasp the taper. This eliminates grinding the fingers to match the taper.

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Carmet Cemented Carbides possess the perfect combination of extreme hardness, strength, and abrasion resistance for the battering that wear parts must take . . . the rubbing, scrubbing, sliding, and scraping.

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For all the facts on carbide wear parts, get Carmet's new booklet on design for wear resistance. It's packed with charts, graphs, case histories, and special design criteria for top wear parts performance. Ask your local A-L representative for a copy, or write: *Allegheny Ludlum Steel Corporation, Carmet Division, Oliver Building, Pittsburgh 22, Pennsylvania. Address Dept. A-8.*

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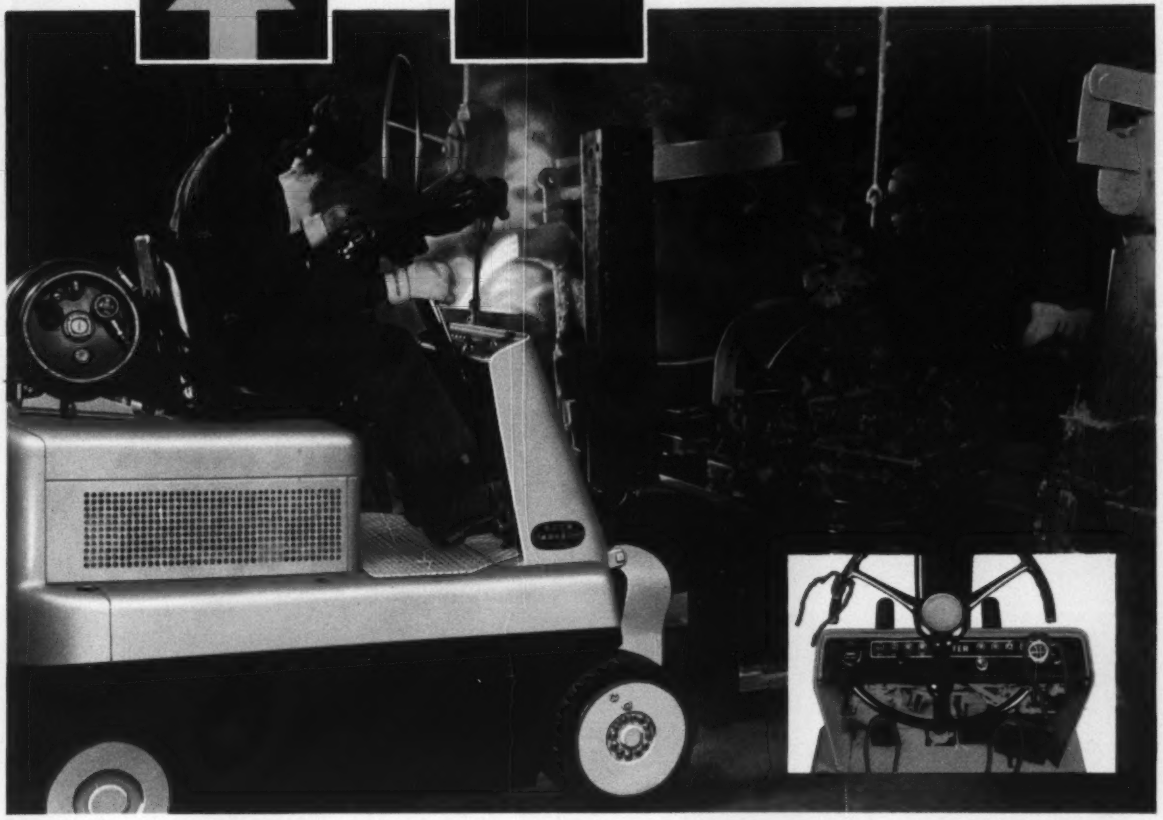

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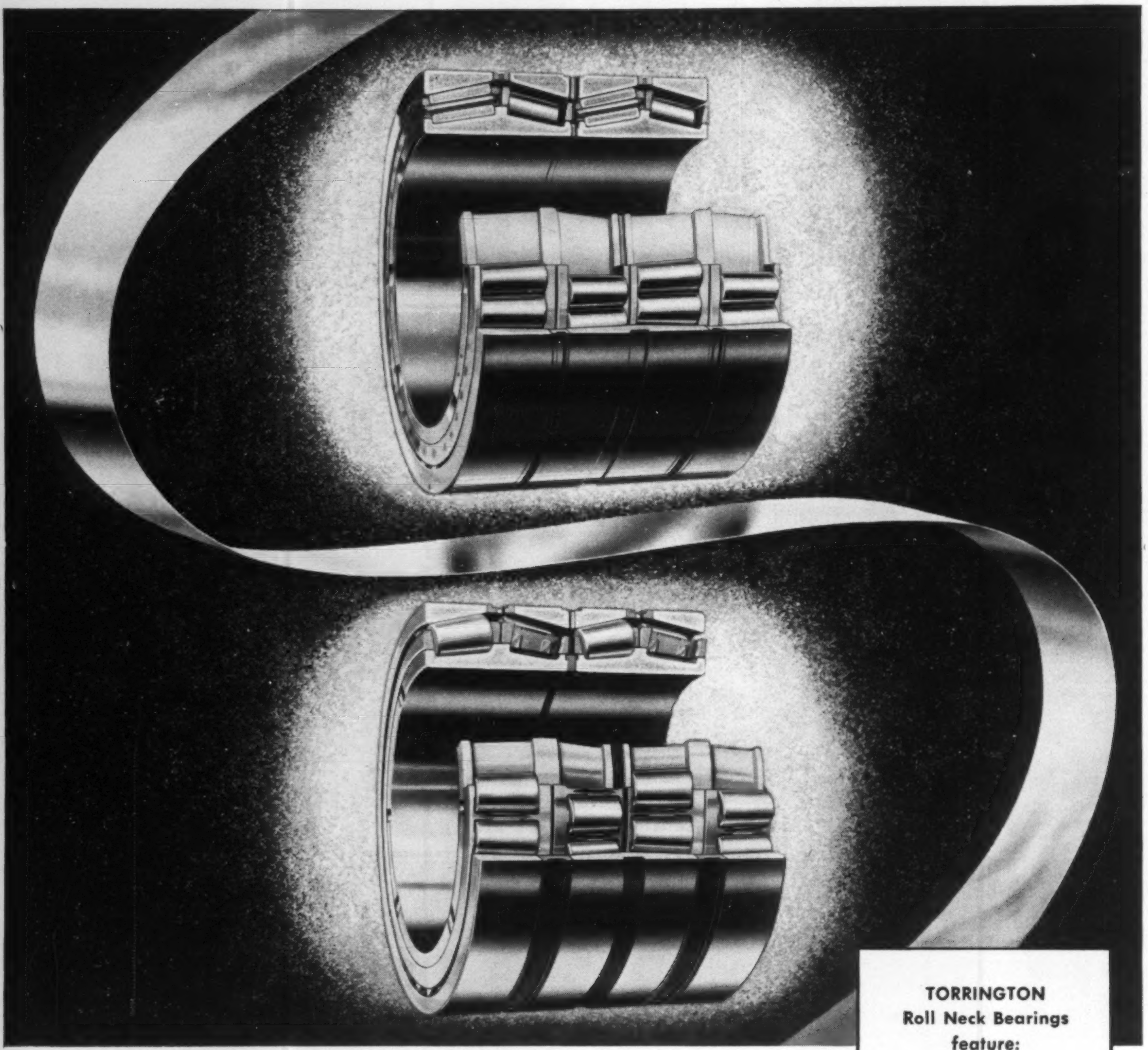

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Roll Neck Bearings
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Tonnage rolled per turn and downtime saved—these measure bearing performance in metal rolling mills.

Torrington Roll Neck Bearings are designed for top performance under tough conditions. Maximum capacity and exceptional life expectancy are combined in bearings that operate efficiently under the severest thrust and radial loads. Torrington's advanced heat treating of carburizing-grade steels provides optimum resistance to wear and shock loads. Lubricant grooves on cone faces minimize roll neck galling under creep conditions.

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LETTERS FROM READERS

With Interest

Sir—I have read with interest the first two of a four-part series of articles on "Planned Profits" by Mr. S. A. Tucker, which appeared in the July 14 and July 21 editions of your magazine. Kindly send me reprints of each article and, if you will, include my name for reprints of the forthcoming articles.—D. L. Carlson, General Electric Co., Erie, Pa.

- **All four reprints will be sent.—Ed.**

Again Masterful

Sir—Your IRON AGE editorial of July 28 is again a masterful piece of print. We don't want any more "new frontiers" of the New Deal. What the New Deal was supposed to do—eliminate the Great Depression—it failed to do miserably. But World War II pulled us out. Does Mr. Kennedy mean a "new frontier" for a new war to fulfill his platform promises?—D. E. Davison, Moltrup Steel Products Co., Beaver Falls, Pa.

Very Interesting

Sir—In your magazine you had an article entitled "Ratio Analysis: A System that Controls Production Profits." We found this to be a very interesting article. We would appreciate it if you would send us six copies of this article.—John F. Mealey, Ludlow Valve Manufacturing Co., Inc., Troy, N. Y.

- **Copies are enroute.—Ed.**

A Firm Name

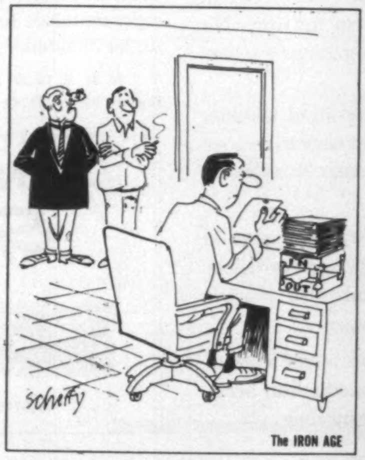
Sir—In a recent issue of your magazine, you had a feature paragraph on improving the solderability of copper by using a tin-immersion process called Wes-X 500. Please send me the name of the firm that developed the process. Any other information about Wes-X 500 that you might also be able to supply will be appreciated.—Vernon Palmer, Melpar, Inc., Falls Church, Va.

- **We suggest that you contact Mr. R. K. Young, Westinghouse Electric Corp., Box 2099, Pittsburgh, 30, Pa.—Ed.**

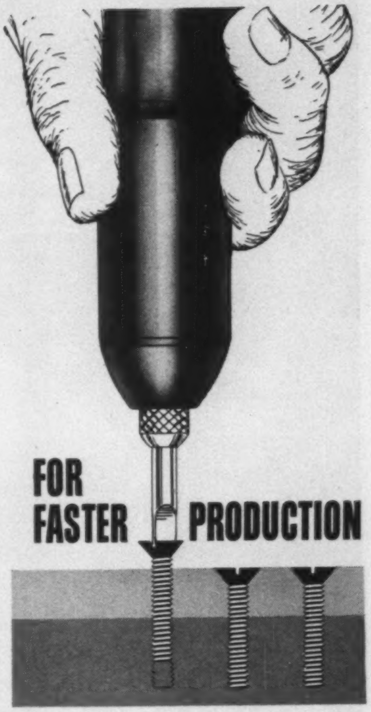
Tube Drawing

Sir—Your magazine recently had an article on tube drawing. I am extremely interested in your comments about the high lubricity oil concerning both the lubricity and the absence of carbon residue after annealing. These are qualities that I have not been able to find in oils that I need for an entirely different product application. Any information you could divulge on this lubricant will be appreciated.—T. M. Thygeson, Kaiser Aluminum & Chemical Corp., Spokane, Wash.

- **For further information about this item you may contact the Backer-Gubbins Co., 1448 Walbash Ave., Detroit, 16, Mich.—Ed.**



"He's only been here two weeks and he's already a month behind."



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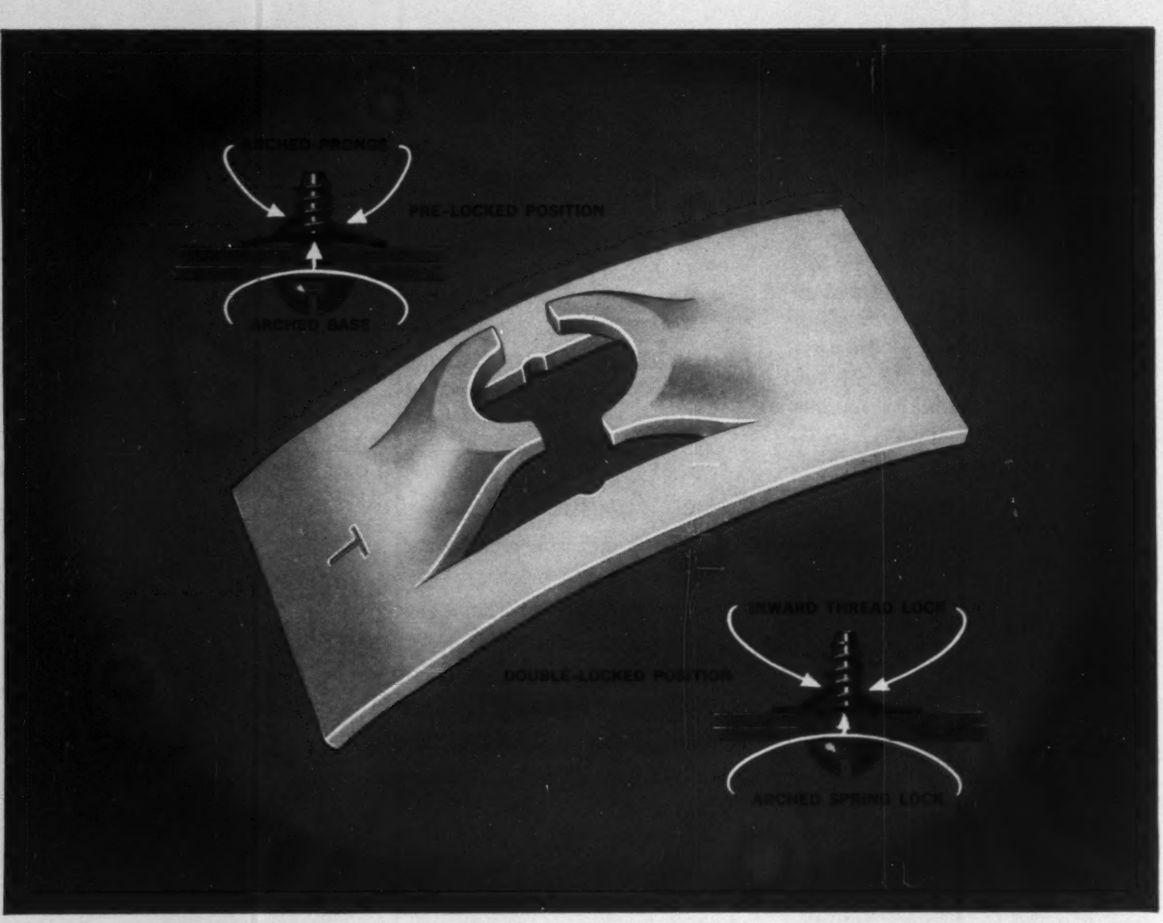

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Tinnerman Flat-Type Speed Nuts are made in a full range of sizes, tensile strengths and corrosion-resistant finishes. Design variations also provide many multiple-function special types.

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For more information, refer to your Sweet's Product Design File, section 7-Ti. Your Tinnerman representative has samples and prices. He's listed under "Fasteners" in the Yellow Pages. Or write to:

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FATIGUE CRACKS

New Pages for Wide Metalworking Horizons

This week you'll notice three new weekly features in The IRON AGE. You'll also notice these and several other features appearing in different places under the bright, new banner **Metalworking Newsfront.**

The purpose of all this: To bring you more business news as it affects metalworking in general and your business in particular.

The Growing Need—The reason? As metalworking has grown, so has management's need for more helpful information to guide business decisions.

The new features starting in this issue bring metalworking executives in administration, production, engineering and purchasing the most significant news in three vital areas: Business conditions, labor, and international business.

Big Lineup—The first of the new features is called **Business Forecast.** If you'll turn to p. 7 you will see a page that presents the most recent trends in business, interpreted for guidance in the months ahead.

Metalworking Labor on p. 9 brings you up-to-the-minute reports on the important labor front. This week, and in weeks to come, you can read here about the latest wage settlements in a broad cross-section of metalworking companies, precedent-setting labor rulings out of Washington and trends in union demands on wages, fringes and work practices.

What American companies are doing to sell abroad, growing competition from imports, and the activities of world trading blocs will be followed closely in **International** on p. 13.

Washington on p. 11 replaces our former Washington column. Each week R. W. Crosby, our Washington editor, will highlight the page with the major Washington news developments and follow up with interpretive news capsules of other important happenings in the nation's capital.

Newsfront, a long-standing favorite with our readers, now appears on p. 15 and is called **Techfront.** The new title marks a shift to even more advanced information on the latest developments in metalworking materials, processes, and equipment.

The record-breaking pace of metalworking technology has caused us to devote this page exclusively to items on the technical side. Market items on metalworking products will be carried in **Market-Planning Digest** on p. 65.

Top of the Order—Most of these news features you'll find conveniently in one place—the front of the magazine. All of them—Business Forecast, Metalworking Labor, Washington Digest, International, Techfront, Market-Planning Digest and Report to Management — are identified by the Metalworking Newsfront banner.

As you look through this week's issue you can't very well miss the Metalworking Newsfront pages. And if you need the very latest news in all areas of metalworking, you can't afford to pass over them.

The IRON AGE

"Whew!"

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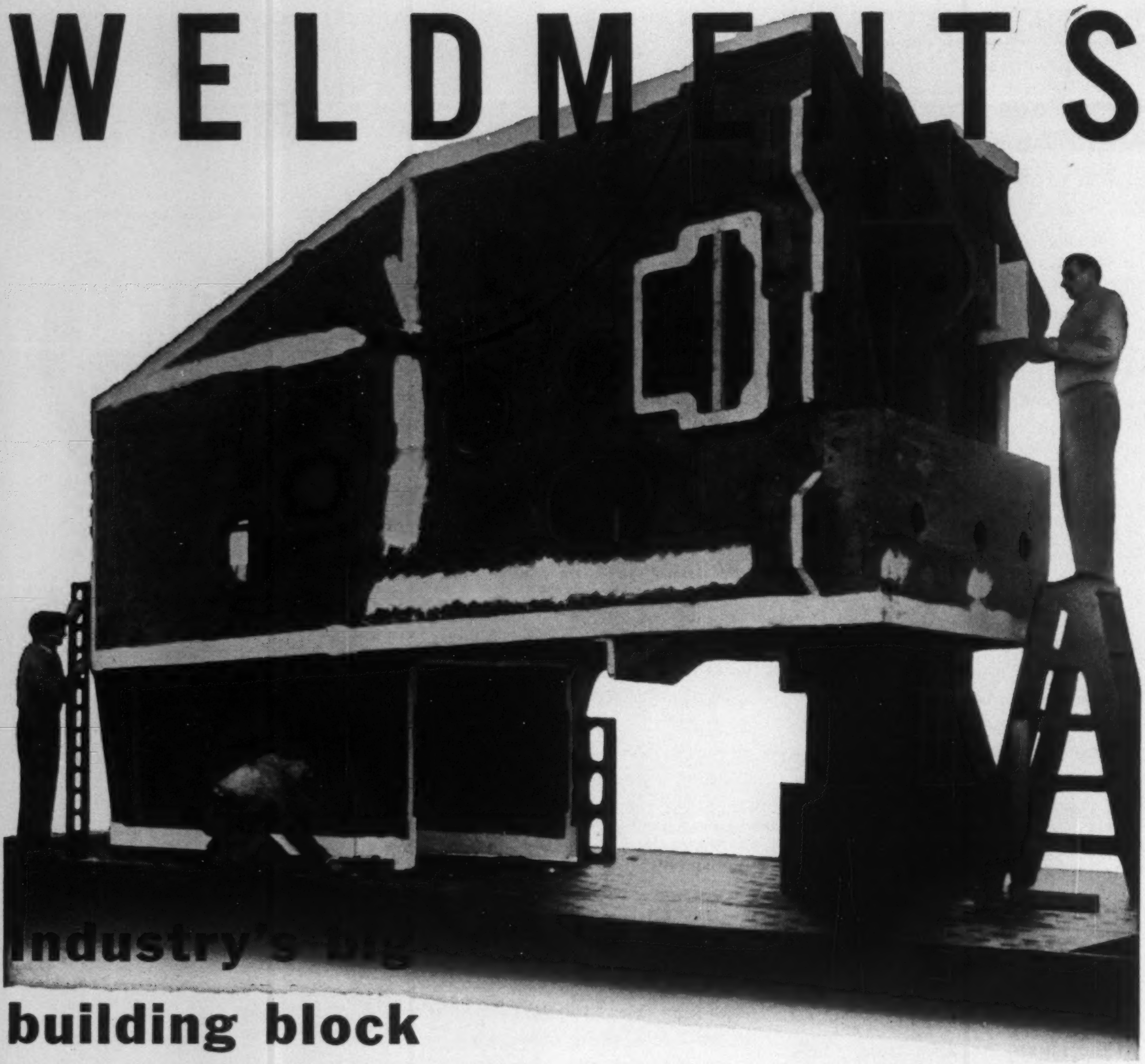

Industry's big building block

You're looking at a 55-ton weldment on a planer. It is typical of the machining—or building of a complete machine of any size—produced regularly in the Sun Ship machinery plant where marine and industrial equipment is built.

In our tank and steel fabricating shop, we build pressure vessels, fractionating towers, weldments, and heavy steel fabrications.

Our completely integrated shops concentrate facilities and skills for producing special machinery and components that meet the most critical standards.

When you need special machinery of any kind, you will want to discuss methods, equipment requirements and possible production layouts with Sun Ship's sales engineers.

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COMING EXHIBITS

Machine Tool Exposition—Sept 6-16, International Amphitheatre, Chicago (National Machine Tool Builders Assn., 2139 Wisconsin Ave., Washington 7, D. C.)

Production Engineering Show—Sept. 6-16, Navy Pier, Chicago, (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Coliseum Machinery Show — Sept. 7-15, Chicago. (Contact: A. B. Perkins, 2216 South Hill St., Los Angeles 7, Calif.)

Iron & Steel Show — Sept. 27-30, Cleveland Public Auditorium, Cleveland, O. (Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22.)

Metal Show—Oct. 17-21, Convention Hall, Philadelphia. (American Society for Metals, Metals Park, Novelty, O.)

Die Casting Exposition & Congress—Nov. 8-11, Detroit Artillery Armory, Detroit. (The Society of Die Casting Engineers, 19382 James Couzens Highway, Detroit 35.)

MEETINGS

SEPTEMBER

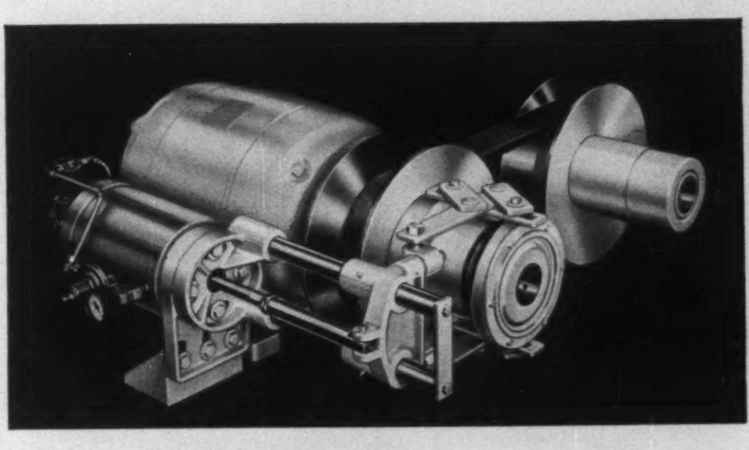
American Machine Tool Distributors Assn.—Annual meeting, Sept. 3-4, LaSalle Hotel, Chicago, Association headquarters, 1500 Massachusetts Ave., N. W., Washington 5, D. C.

Assn. of Lift Truck & Portable Elevator Mfrs.—Fall meeting, Sept. 12, The Cavalier Club, Virginia Beach, Va. Association headquarters, One Gateway Center, Pittsburgh 22, Pa.

Electronic Industries Assn. — Fall conference, Sept. 13-16, French Lick-Sheraton, French Lick, Ind. Association headquarters, 1721 DeSales St., N. W., Washington, D. C.

American Die Casting Institute—Annual meeting, Sept. 14-16, Edgewater Beach Hotel, Chicago, Insti-

(Continued on P. 24)



LEWELLEN

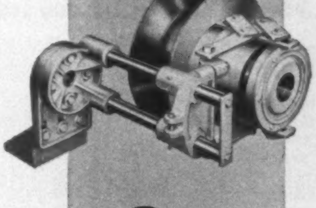
VARIABLE SPEED PULLEYS
AUTOMATICALLY CONTROLLED
WITH PNEUMATIC REGULATOR

Pneumatic regulator mounts adjacent to motor, and connects with Adjustable Pulley to vary speeds smoothly over a wide range.

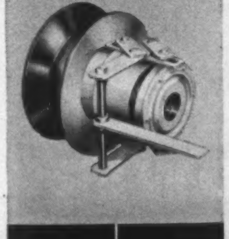
The regulator is controlled from process instruments, and responds precisely to a signal range of 3 to 15 psi.

The speeds obtained conform accurately to signal pressure changes. Speeds are varied, maintained, or repeated with the signal pattern.

Here is a method for controlling the process continuously, using the readily automated flexibility of variable speeds.



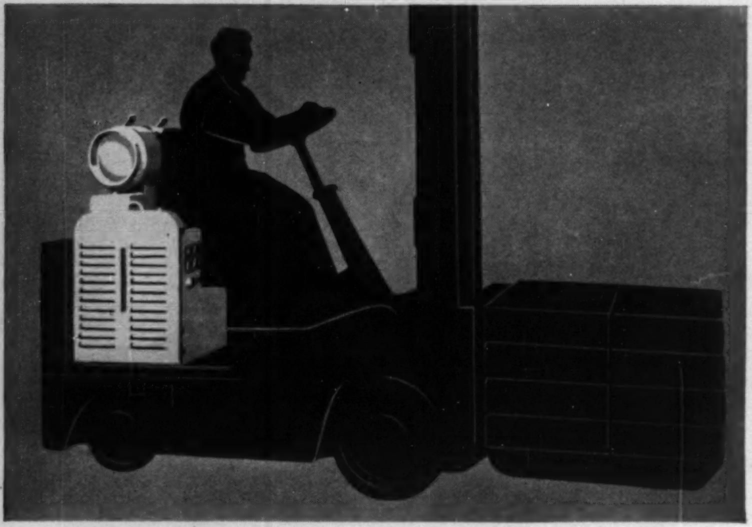
Adjustable Pulley equipped with lever shifter and operator for mounting pneumatic, hydraulic, or mechanical regulator.



Adjustable Pulley equipped with lever shifter for any motion control.

We Welcome Your Inquiry

LEWELLEN
Manufacturing Company, Columbus, Indiana
Distributors in all Industrial Areas



LP-Gas Model HA-3 with recessed housing can be installed on sit-down trucks without seat alteration.

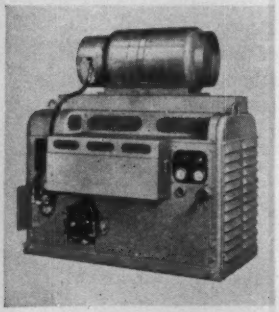
Ready-Power Units Power Trucks At Lowest Cost Per Ton-Mile

ASSURE FULL-TIME POWER FOR YOUR ELECTRIC TRUCK

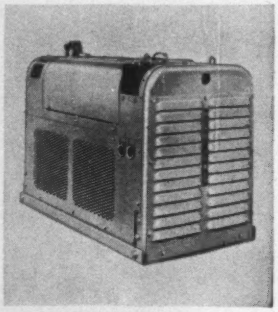
It costs you less to move materials when your electric truck is equipped with Ready-Power. The compact Ready-Power Unit consists of a dependable industrial engine and DC generator. It is easily installed or interchanged on practically any make of truck and generates full capacity power whenever needed. There is no power lag, no truck slowdown. Ready-Power also eliminates the constant recharging and replacement of stored power.

Save money and assure full-time power for your materials handling vehicles. Mail the coupon below for complete information on Ready-Power Units.

SERIES HA FOR FORKS UP TO 8,000 LBS., PLATFORMS UP TO 10,000 LBS.



Ready-Power Series HA Units are designed for use with medium size fork, platform and crane trucks. They are available with gasoline or LP-Gas fueling systems, with conventional housing for stand-up trucks or recessed housing for sit-down trucks.



READY-POWER

FREE TECHNICAL BULLETIN 99A

READY-POWER
POWER THAT PAYS

Mail this coupon

The Ready-Power Company
3822 Grand River Avenue
Detroit 8, Michigan

Name____
Company____
Address____
City________________Zone____State_______________

MEETINGS

(Continued from P. 23)
tute headquarters, 366 Madison Ave., New York.

National Foundry Assn. — Annual meeting, Sept. 22-23, Edgewater Beach Hotel, Chicago. Association headquarters, 53 W. Jackson Blvd., Chicago.

Porcelain Enamel Institute, Inc.—Annual meeting, Sept. 25-28, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1145 19th St., N. W., Washington, D. C.

Farm Equipment Institute—Annual convention, Sept. 25-28, The Statler Hilton Hotel, Dallas, Tex. Institute headquarters, 608 S. Dearborn St., Chicago.

American Welding Society — Fall meeting, Sept. 26-30, Pittsburgh. Society headquarters, 33 West 39th St., New York.

OCTOBER

Metal Lath Mfrs. Assn.—Fall meeting, Oct. 6-7, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, Engineers Bldg., Cleveland.

The Electrochemical Society, Inc.—Fall national meeting, Oct. 9-13, Shamrock Hotel, Houston, Tex. Society headquarters, 1860 Broadway, New York.

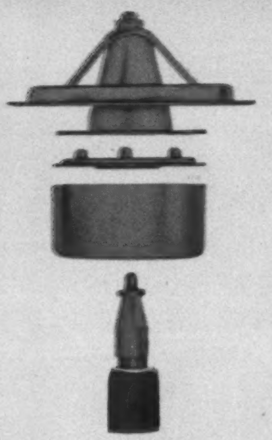
American Gas Assn.—Annual convention, Oct. 10-12, Atlantic City. Association headquarters, 420 Lexington Ave., New York.

Pressed Metal Institute — Annual meeting, Oct. 10-14, Shawnee Inn, Shawnee-On-Delaware, Pa. Institute headquarters, 3673 Lee Rd., Cleveland.

Marking Device Assn. — Annual convention, Oct. 12-14, Hotel Roosevelt, New York. Association headquarters, 912 Chicago Ave., Evanston, Ill.

Steel Boiler Institute, Inc. — Fall meeting, Oct. 12-14, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1308 Land Title Bldg., Philadelphia.

AGAIN-



EXPLODED VIEW OF AUTOSTAT® made by FULTON SYLPHON DIV., Robertshaw-Fulton Controls Co., shows impact extruded cup made from Revere Copper Rod. Other parts of this superior thermostat used in pressurized cooling systems in automobiles and other automotive equipment, are made of 70/30 Revere Brass Strip.

Revere helps "fit the metal to the job"

AND A LEADING MANUFACTURER OF AUTOMOTIVE THERMOSTATS IS ABLE TO PRODUCE A SUPERIOR PRODUCT FOR LESS MONEY

That little unimportant-looking copper cup shown above originally posed a king-sized production problem. It is a critical part of a newly designed automotive thermostat made by the Fulton Sylphon Division of the Robertshaw-Fulton Controls Co., Knoxville, Tenn.

In the early stages this copper cup was machined from free cutting copper rod, but this proved costly due to the high rate of scrap from the machining operation and the relatively high cost of turning out the machined part. At this point Revere Technical Advisors got together with Fulton Sylphon Engineers and the possibility of an impact extrusion was discussed. Revere T.A.'s in turn contacted suppliers who might furnish these extrusions in copper, to see whether or not they could be produced economically and to the demanding specifications required.

After exhaustive tests it was found that the cup could be impact extruded to meet the exacting hardness specifications of Fulton Sylphon. During its development, many problems involving temper, grain size and control of the chemical composition of the copper rod had to be solved.

In addition to the Copper Cup, Revere also supplies 70/30 Brass Strip from which other parts of the AUTOSTAT® are fabricated.

Said a Fulton Sylphon purchasing agent, "When you ask Revere for help you really get results."

This is still another case of how Revere, a supplier, working with still another supplier, was able to help its customer produce a superior product for less money. Why don't you take advantage of this service?

REVERE COPPER AND BRASS INCORPORATED
Founded by Paul Revere in 1801
230 Park Avenue
New York 17, N. Y.

Mills: Rome, N. Y.; Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles, Riverside and Santa Ana, Calif.; New Bedford, Mass.; Brooklyn, N. Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities, Distributors Everywhere.

FROM **CRUCIBLE** LOCAL STEEL CENTERS*

IMMEDIATE DELIVERY OF MOST ITEMS is standard procedure at Crucible steel centers. Stocks are continually replenished to meet customers' maximum needs.

IMMEDIATE DELIVERY

To meet your deadline, warehousemen at integrated Crucible steel centers fill orders from local stocks of 16,000 specialty steel items—load-up for immediate delivery.

A superintendent-production shouts into your phone: "I've got an emergency! I need 3 bars of plastic mold steel—as fast as you can get it!"

So you call the local Crucible steel center. You call Crucible first because you know that it keys its stocks of specialty steels to customers' *maximum* needs. And you know from experience that Crucible makes every effort to give you on-time delivery, even if it has to draw from Crucible centers miles away.

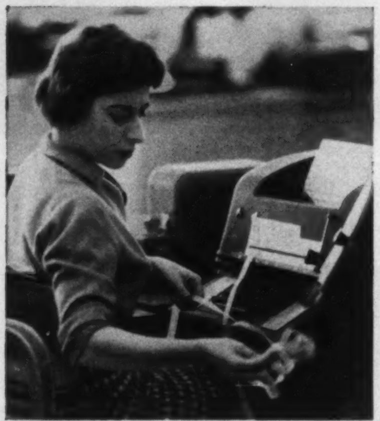
Crucible's local steel centers are your best sources for almost every steel service. They're staffed to offer expert assistance on metalworking problems. They can arrange for "extras" such as slitting, polishing, forging, heat treating, etc. Most important, they're your local contacts with the entire Crucible operation—integrated from steel making to local delivery to you.

Crucible Steel Company of America,
Dept. PB06, Pittsburgh 30, Pa.

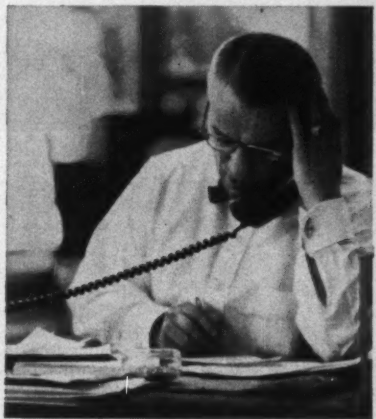
CRUCIBLE
ALLOY STOCK LIST

MONTHLY STOCK LIST gives you up-to-date news on local stocks of specialty steels. Ask the Crucible salesman to put your name on the mailing list.

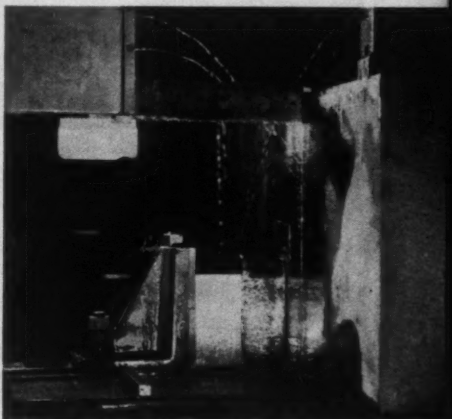
***FROM CRUCIBLE LOCAL STEEL CENTERS:** TOOL STEELS— Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks • HIGH SPEED STEELS—Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits • STAINLESS STEELS —Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles • FREE MACHINING STEELS—Crucible Max-el® rounds, hexagons, plates and brake die steel • ALLOY STEELS—Bars, billets, strip and sheet • COLD ROLLED CARBON SPRING STEELS • DRILL STEELS—Hollow and solid drill steels • ALUMINUM EXTRUSION DIE STEELS • HOLLOW TOOL STEEL • HARD FACING ROD • PLASTIC MOLD STEELS • PERMANENT MAGNETS • and many others.



TELETYPE NETWORK LOCATES STEELS anywhere in the U.S.A. within minutes! Nation-wide system connects every link in Crucible's integrated operation—covers 22,000 airline miles of circuitry.



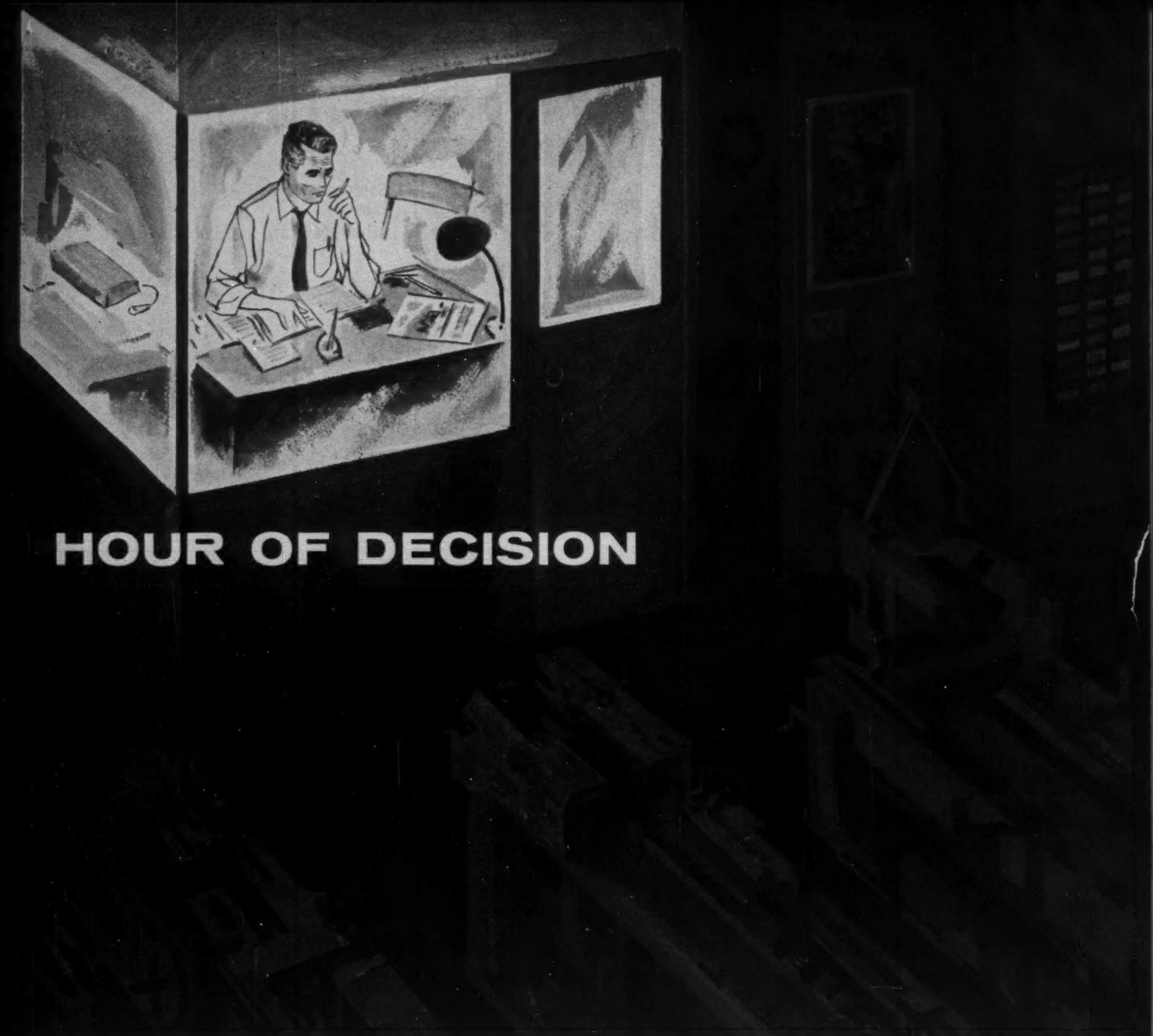
CALL FOR CRUCIBLE SERVICES. A local phone call brings you services such as arranging for "extras", metalworking assistance, and special metals research.



HUGE HACKSAWS AND FAST-CUTTING BANDSAWS at each steel center assure you of accurately cut sections and prompt delivery of the sizes you need.

CRUCIBLE STEEL COMPANY OF AMERICA

BRANCH OFFICES AND STEEL CENTERS: Atlanta • Baltimore • Boston • Buffalo • Caldwell, N.J. • Charlotte • Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton Denver • Detroit • Erie, Pa. • Grand Rapids • Houston • Indianapolis • Los Angeles • Miami • Milwaukee • Minneapolis • New Haven • New York • Philadelphia Pittsburgh • Portland, Ore. • Providence • Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Mass. • St. Louis • E. Syracuse • Tampa • Toledo • Tulsa



After hours? — sure You're not surprised at that because you know it's when he (and probably you, too) concentrates on the problems which are vital to his company's continued successful growth. The day is filled with production crises, maintenance problems, personnel questions, and committee meetings. It's only now that he can really study the facts and decide what's best.

Right now he's reviewing his machine tool inventory. He's amazed at how old some of his equipment is getting to be. It seems only yesterday that he signed the purchase order for it to increase his capacity for World War II. But that was 1943, seventeen years ago! No wonder maintenance is getting high and efficiency is dropping off.

We've got a suggestion for this man (and for you, too). Attend THE MACHINE TOOL EXPOSITION — 1960 and see for yourself why Modern Machine Tools = Production Efficiency. This exhibit, the first since 1955, is sponsored by The National Machine Tool Builders' Association* and will contain eleven acres of the U.S.A.'s newest machine tools under power, cutting and forming metal to demonstrate 1001 ways to lower production costs. Can you afford to stay home?

You're also invited to the PRODUCTION ENGINEERING SHOW on the Navy Pier.

No extra registration needed.

*The N.M.T.B.A. represents 90% of the U.S.A. machine tool industry.

FORMULA FOR TOMORROW

MODERN MACHINE TOOLS
MMT=PE
PRODUCTION EFFICIENCY

International
Amphitheatre
Chicago, Illinois
Sept. 6-16

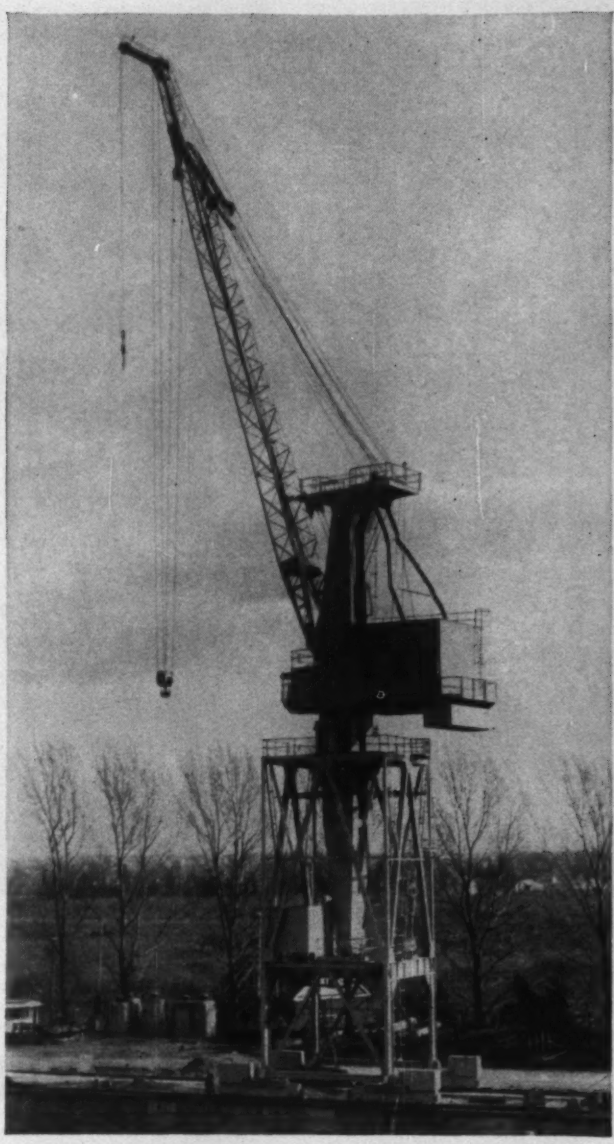
THE MACHINE TOOL EXPOSITION — 1960

For information write to

NATIONAL MACHINE TOOL BUILDERS ASSOCIATION

2139 Wisconsin Avenue, N.W. • Washington, D. C.

Timken® bearings help giant Provincial crane take punishment of hoisting 55-ton loads

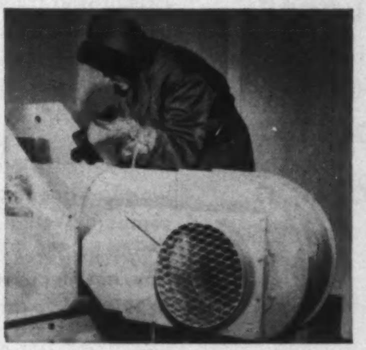


So tall it carries aircraft warning lights, this 20-story high, 55-ton capacity Provincial traveling jib crane handles huge loads at Port Weller, Ontario, ship berths. To take the tremendous, swinging loads, 26 Timken® tapered roller bearings are used at vital points: main hoist gear case, auxiliary hoist gear case, luffing gear case, main and auxiliary hook blocks.

The tapered design of Timken bearings enables them to take radial and thrust loads in *any* combination. Especially important in this application, they take the end thrust from single helical gearing. And full line contact between rollers and races gives Timken bearings extra load-carrying capacity.

The separable components of Timken bearings simplify assembly, too. They permit independent assembly of cone on shaft, cup in housing. Assembly of closely fitted bearing parts does not have to be made by driving through the rolling elements.

ENGINEERING SERVICE ON-THE-SPOT from our graduate engineer salesmen helps you solve bearing problems right at the design stage. You save time and money.



WEATHER CONTROL "LAB". We test bearing performance under all conditions of operation, including temperatures as low as -60°F. to make sure Timken bearings roll the loads anywhere and in any weather.

Industry rolls on

TIMKEN®

tapered roller bearings

The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.* Canadian Division: Canadian Timken, St. Thomas, Ont.

MOVIE:
"STOP LOSS"
CO-ORDINATED
BOOKLETS
INFORMATIVE
FILM
PACKAGE
"STOP
LOSS"
Organized
Lubrication

MOVIE: "STOP LOSS WITH ORGANIZED LUBRICATION," a new 20-minute color-and-sound film created to show the opportunities for cost control through Organized Lubrication.

EDUCATIONAL FILM PACKAGE for plant departments consists of movies on greases, hydraulic oils, cutting oils, etc., that may be selected after seeing the "Stop Loss" film.

HERE ARE THE TOOLS THAT CAN HELP YOU

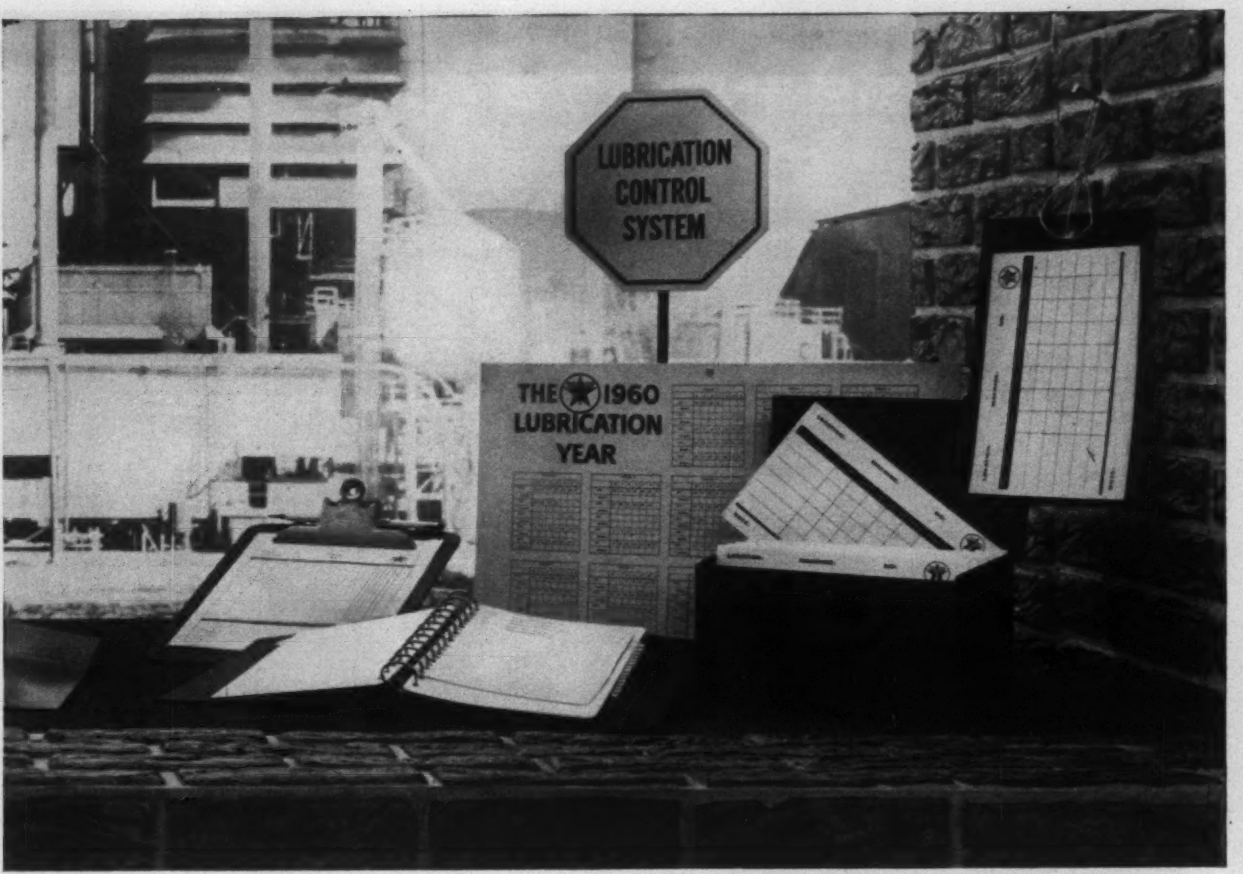
INCREASE YOUR NET PROFITS

Texaco's new "Stop Loss" program is designed to cut maintenance costs by modernizing lubrication practices. If yours is an average plant, the results can add 4 per cent to your net profit.

Even if your plant is an efficient operation, it is still virtually certain that there is an opportunity for cost control you are overlooking—either partially or completely. Here's what the Small Business Administration says in a recent publication:

Suppose there is an average plant, which sells $1,000,000 worth of goods per year. The net profit of this average company would be $73,400 and the maintenance cost would be $29,900. Now, suppose that by *better lubrication*, maintenance costs are reduced 10%, or $2990, *the $2990 will go directly into profit*—an increase of 4%.

A Texaco "Stop Loss" Program is designed for you. Texaco has developed a program specifically designed to help cut your maintenance costs via better lubrication practices. It will help you increase machine life, minimize downtime, reduce lube inventory, even cut purchasing costs. And the savings you make go directly into profits.



CO-ORDINATED BOOKLETS on the film subjects and others can be used as guides in specific areas.

TEXACO LUBRICATION CONTROL SYSTEM takes the guesswork out of your lubrication scheduling. It costs almost nothing to install, yet can add thousands of dollars a year to profits.

BY AS MUCH AS 4 PER CENT!

Can your plant pass this test? If the answer is "no" to any of the following questions, it is almost certain that a Texaco "Stop Loss" Program can improve your profit picture.

1. Is there a central source of responsibility in your plant for *all* lubrication? Yes ☐ No ☐
2. Can your machine operators devote all their time to production without worrying about lubrication? Yes ☐ No ☐
3. Is there any system for making sure that equipment gets lubricated in the right spots at the right time? Yes ☐ No ☐
4. Have you had a lubrication study made to eliminate costly duplication of lubricants? Yes ☐ No ☐
5. Are your oilers qualified men with knowledge of mechanisms lubricated? Yes ☐ No ☐

See for yourself how "Stop Loss" works! Texaco has just released a new color-and-sound movie to dramatize the benefits of good lubrication practices. It's called "Stop Loss through Organized Lubrication" and we think it would be valuable to you to see it. For a showing in your plant soon, mail in the coupon today!

Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

MAKE YOUR RESERVATION TODAY!

TEXACO INC., Dept. IA-160
135 East 42nd Street
New York 17, New York

I would like to see "Stop Loss through Organized Lubrication." Please call to arrange a showing in my plant.

Name________________ Title__________

Firm__________________________

Address__________________________

City________________ Zone____ State______

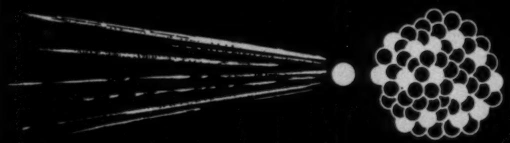
TEXACO

AT HOME IN THE ATOMIC AGE...

Matter of fact, stainless steel is more at home in these demanding times than ever before. Rigid requirements in modern components—rather than restricting the use of stainless—have opened an even broader market for this versatile metal. Its remarkable durability and superior resistance to corrosion and heat make stainless all but indispensable in the construction and operation of atomic energy plants. Eastern is proud to have a share in this vital activity.

Eastern is the world's largest exclusive producer of stainless steel sheets and plates. Sold through steel service centers coast to coast.

ES EASTERN
STAINLESS STEEL
BALTIMORE 3, MARYLAND, U.S.A.
Stainless steel sheets, plates, strip, coils



Above: Schematic drawings show how nuclear fission occurs. One atom becomes two, releasing energy.

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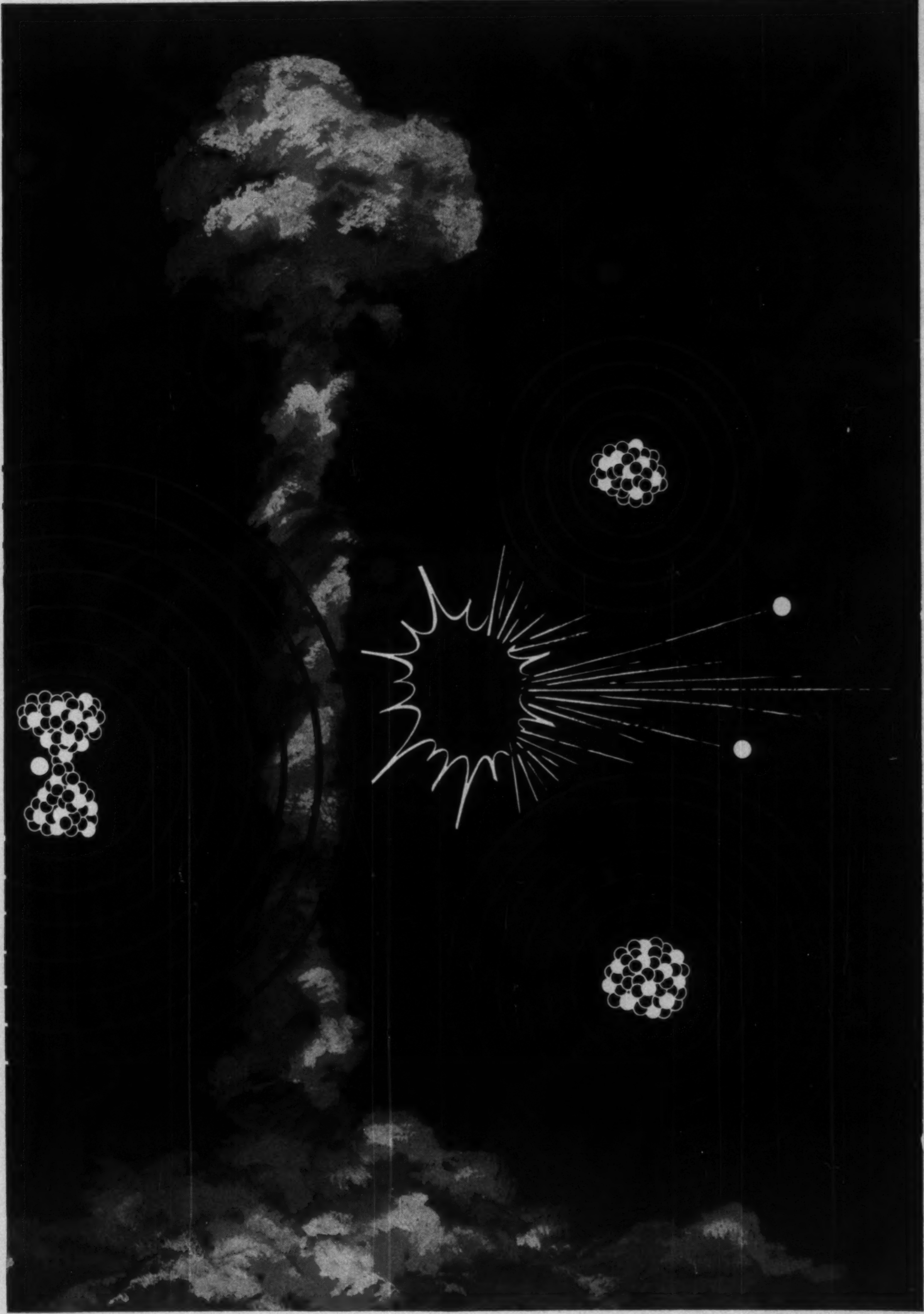


PROGRESS REPORT

STORA-KALDO OXYGEN STEELMAKING DEVELOPMENTS

In England, the Consett Iron Company Limited recently announced plans to install two 110-ton Stora-Kaldo convertors . . . in France, Sollac (Societe Lorraine de Laminage Continu) began operating their new 110-ton Stora-Kaldo converter in April . . . in Oxelosund, Sweden, another facility with 110-ton vessels will start production early in 1961 . . . in Domnarvet, Sweden, installation of converters of comparable capacity has been programmed.

The original 30-ton facility at Domnarvet has passed the three-hundred-thousand-ton mark. Steelmakers from the United States have witnessed production, by this process, of a wide range of grades of carbon steel—1005 to 1095—without recarburization. The specified steel chemistry and tapping temperatures were met exactly. Slabs and ingots were shipped to the United States and processed into finished products, ranging from deep-drawing material to cutlery stock. Comments from ultimate users ran from "good" to "the best material we ever had."

These events and the facts detailed below are causing more and more steel producers to take a close, hard look at the Stora-Kaldo process:

FACT NO. 1. What is believed to be the largest single heat—122 tons—ever produced in a basic oxygen converter of any type was produced by Sollac with its Stora-Kaldo facility (23 cubic feet of furnace volume per ton of rated capacity). Consistent heats of 130 tons and more are programmed as this installation reaches normal production later this year.

FACT NO. 2. The ingot yield of virtually every heat at Sollac *has exceeded* 90 per cent since operations started.

FACT NO. 3. Capital costs for a Stora-Kaldo installation are comparable to or lower than competitive processes for equivalent capacity and conditions.

FACT NO. 4. The Stora-Kaldo process is inherently flexible in its ability to produce, within precise metallurgical limits, a wide variety of carbon steels on a heat-to-heat basis—not a "hit or miss" basis—without recarburization and at desired tapping temperatures.

FACT NO. 5. Slag analyses show refractory consumption of 24 pounds per ton of steel, during initial operations of a 110-ton Stora-Kaldo converter, when heat times were considerably longer than normal during crew training programs. This performance substantiates the value of recent lining design developments and assures continuous operation of two vessels in a three vessel plant.

FACT NO. 6. The process can be operated with 96 to 98 per cent purity oxygen to produce steel having a nitrogen content of .003 per cent or less. A typical heat analysis using 99.5 per cent oxygen showed:

	Hot Metal	*Ladle*
C	3.6	.061
Mn	.330	.395
P	1.7	.015
S	.045	.011
N_2	—	.002

FACT NO. 7. Oxygen flow rates currently are 5,000 cubic feet per minute and are being accelerated. Oxygen consumption is approximately 1,950 cubic feet per ton of steel when scrap is used for cooling.

FACT NO. 8. High percentages of scrap and ore can be used for coolant. The thermal efficiency of the process permits scrap addition of up to 50 per cent of total metallics charged. This will produce one and three-quarter tons of steel per ton of hot metal. If ore is used for coolant, approximately one ton of steel is produced per ton of hot metal.

FACT NO. 9. Size of gas cleaning equipment required is modest because carbon monoxide is almost totally burned inside the furnace. The exhaust hood is a simple water-cooled duct. The oxygen lance is a water-cooled pipe which projects through and is connected to the hood. The lance is automatically positioned as the hood is moved into place. Normal lance life is in excess of one thousand heats.

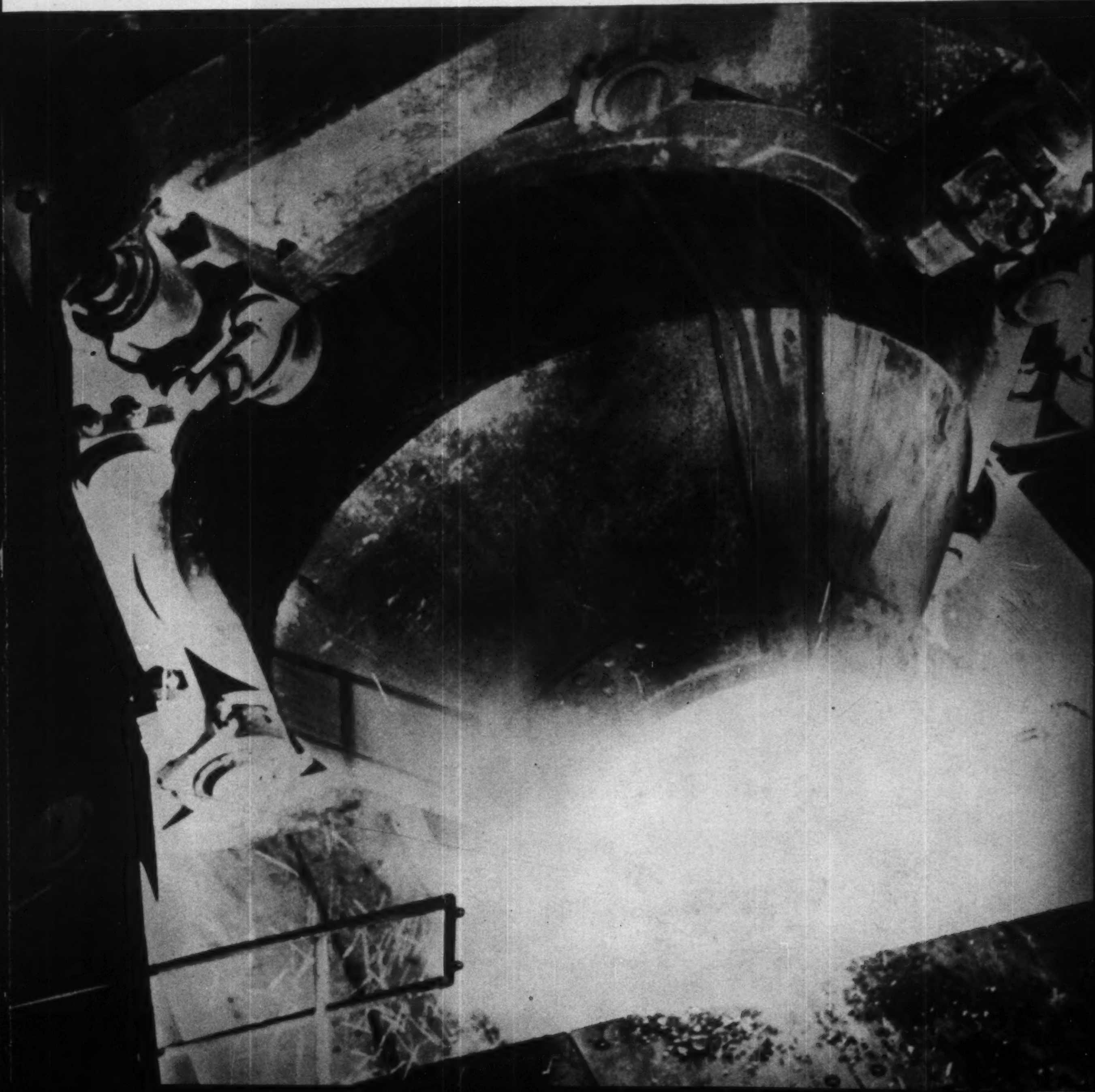
Engineering specialists are available to prepare economic and feasibility studies to help you evaluate the Stora-Kaldo process as it applies to your individual operations. Under United States and Canadian rights granted by Stora Kopparbergs Bergslags Aktiebolag, Sweden, Dravo can furnish complete design, manufacturing, construction and installation of Stora-Kaldo facilities, providing undivided responsibility for the entire contract.

For more information, write or phone Dravo Corporation, Pittsburgh 22, Pennsylvania, EXpress 1-2600.

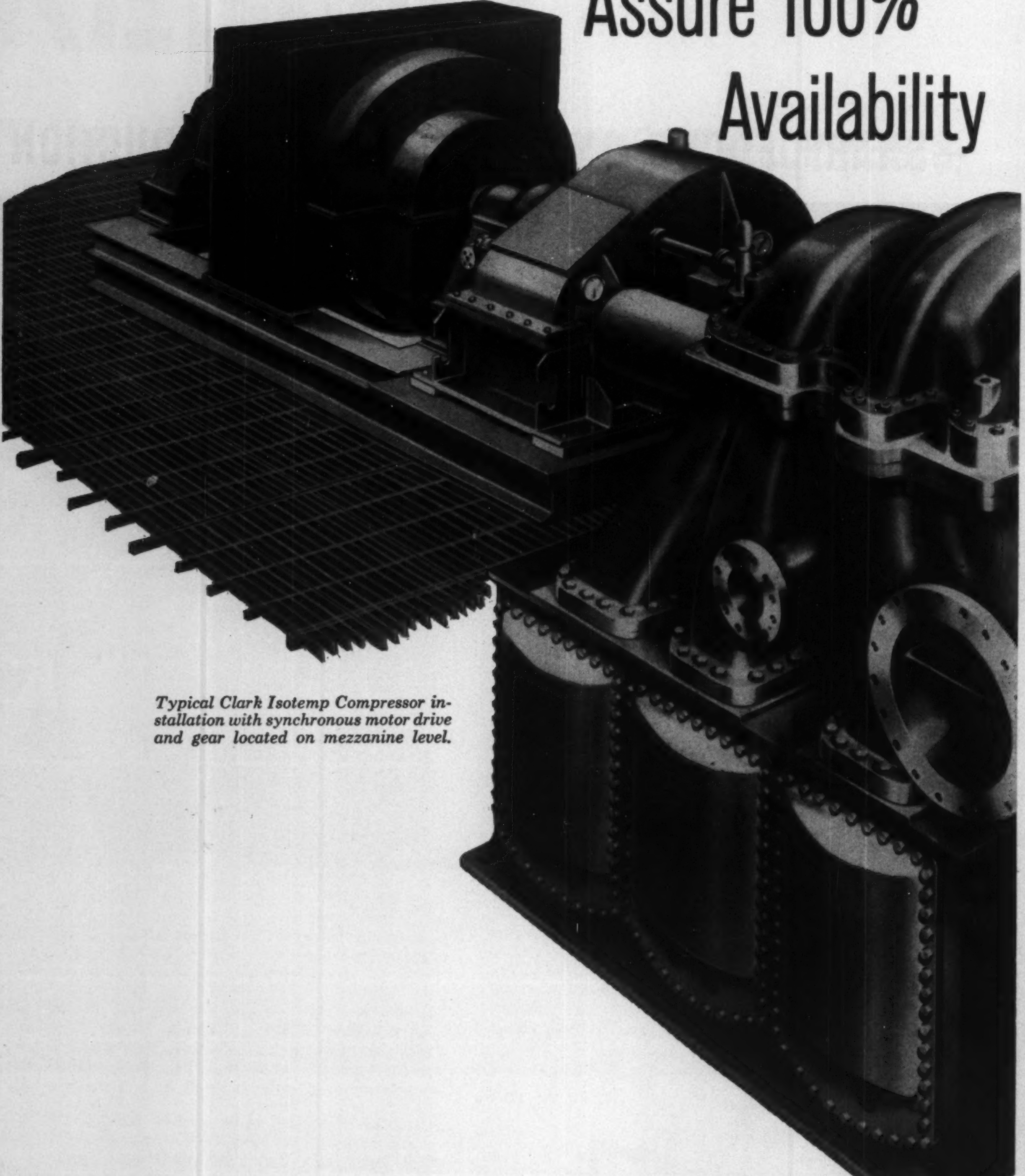
DRAVO

CORPORATION

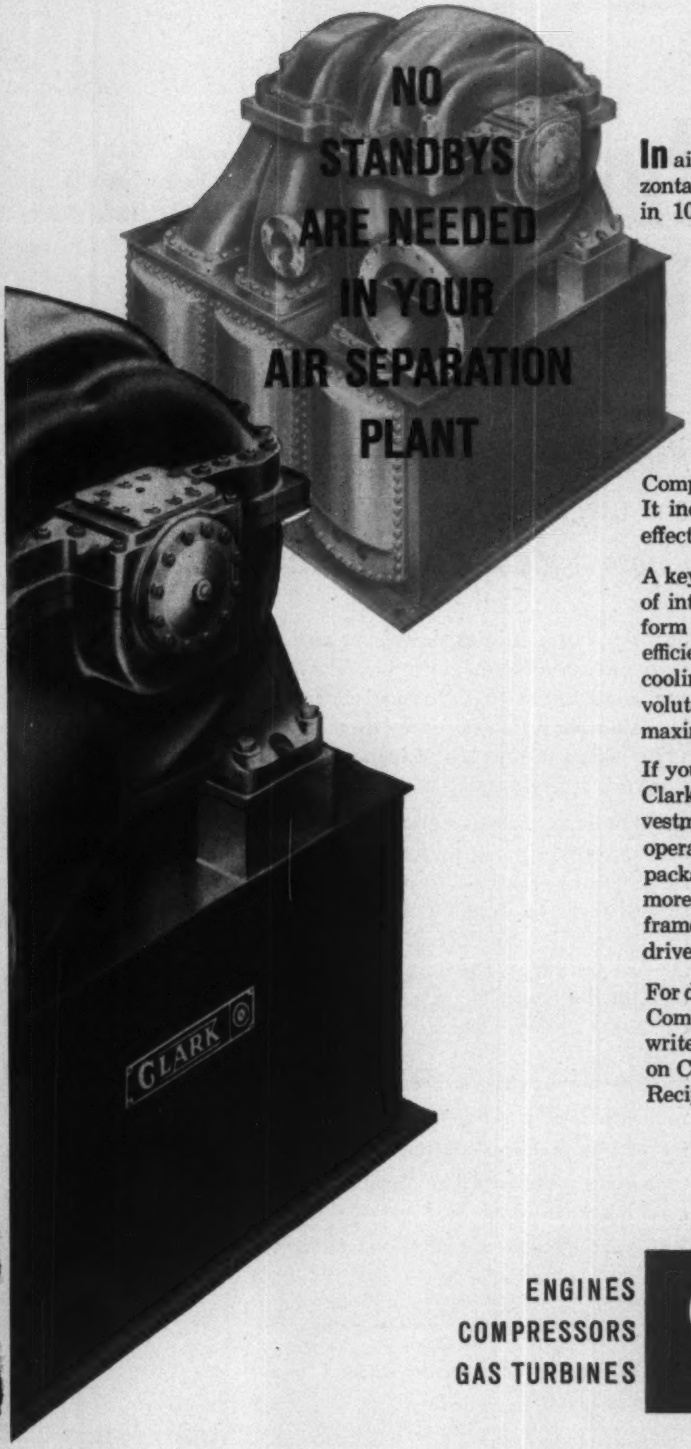
—SHARP FOCUS ON BETTER STEEL PRODUCTION



CLARK Centrifugal Compressors Assure 100% Availability



Typical Clark Isotemp Compressor installation with synchronous motor drive and gear located on mezzanine level.



NO STANDBYS ARE NEEDED IN YOUR AIR SEPARATION PLANT

In air separation plants throughout the world, Clark Horizontally-Split Centrifugal Oxygen Compressors are operating in 100% service. Because the Type HS Compressors are literally maintenance free, standby units have not been required. The performance of these machines has been outstanding with safety, dependability and efficiency being among the features "best liked" by operators.

Now, another centrifugal compressor has been added to the Clark line of air separation compressors. The new Clark Isotemp Centrifugal Air Compressor has been designed to provide highest purity, primary 110 psi. air for tonnage oxygen plants. Like the Type HS Oxygen Compressors, the *Isotemp* is designed for 100% availability. It incorporates many of the design features found to be so effective in the oxygen machines.

A key feature of the Clark Isotemp Compressor is the system of integral intercoolers. Built into the base of machine, they form a compact unit-engineered package. An unusually high efficiency over a wide operating range is produced by intercooling between stages, the use of closed-type impellers and volute diffusers. Single-case, horizontally-split design assures maximum accessibility and eliminates alignment problems.

If you need high purity compressed air in large volumes, the Clark *Isotemp* will provide substantial savings in capital investment, space, foundation requirements, maintenance and operating costs. The *Isotemp* is built in seven frame sizes in packages with capacities ranging from 5000 to 50,000 cfm and more. Clark Oxygen Compressors are available in matching frame sizes. Both the Isotemp and Type HS units can be driven by synchronous motors, induction motors or turbines.

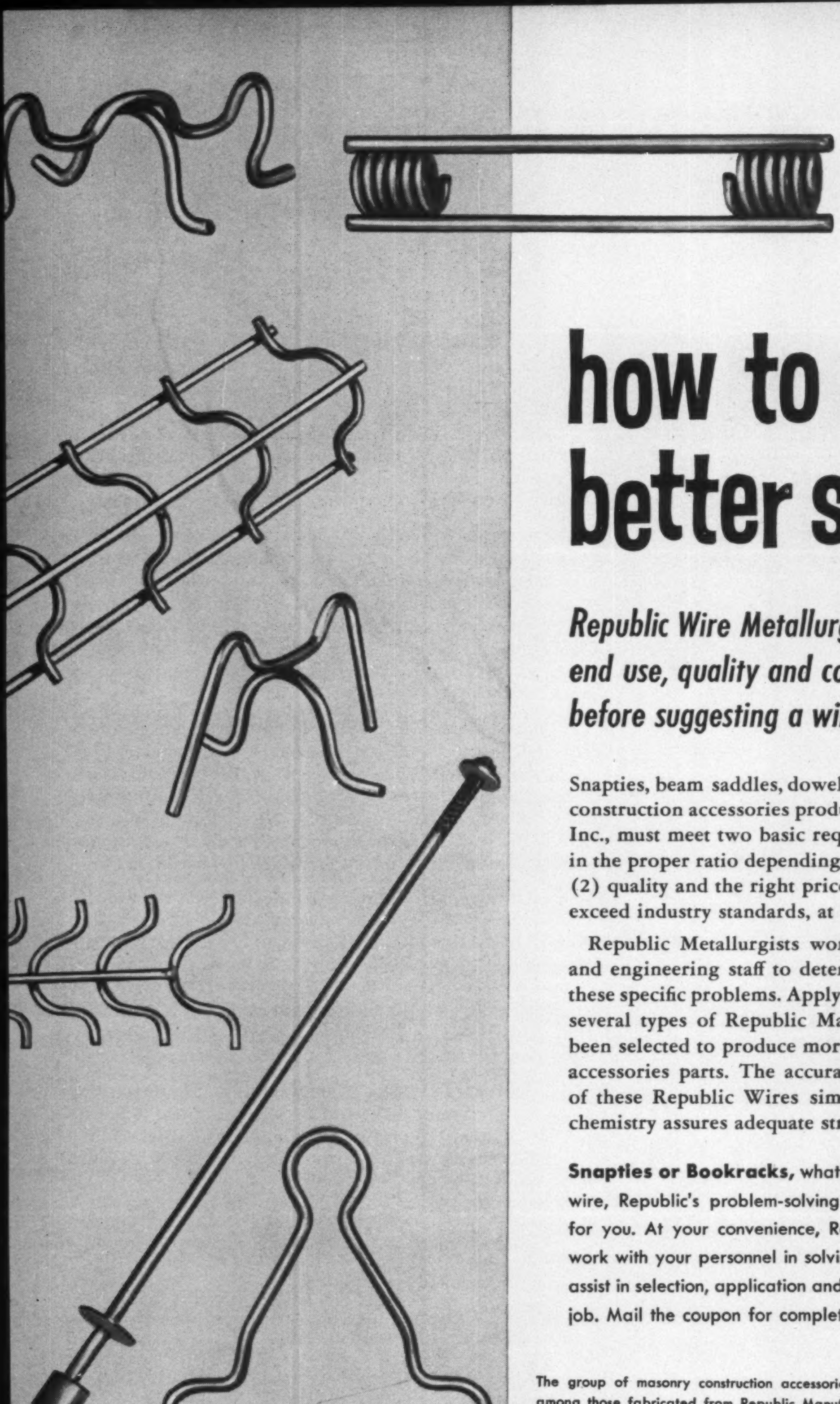
For data on Clark Centrifugal Compressors and Reciprocating Compressors consult your nearest Clark representative or write for Bulletin 175 on Isotemp Compressors, Bulletin 150 on Centrifugal Oxygen Compressors or Bulletin 160 on Clark Reciprocating Process Compressors.

CLARK BROS. CO.
OLEAN, N.Y.

ENGINES
COMPRESSORS
GAS TURBINES

CLARK®

DRESSER
INDUSTRIES
INC.
OIL • GAS • CHEMICAL
ELECTRONIC • INDUSTRIAL



how to make a better snaptie...

Republic Wire Metallurgists investigate product end use, quality and cost requirements before suggesting a wire specification

Snapties, beam saddles, dowel bar chairs, and other masonry construction accessories produced by Meadow Steel Products, Inc., must meet two basic requirements—(1) tensile strength in the proper ratio depending on the end use of the part, with (2) quality and the right price to enable MEDCO to equal or exceed industry standards, at a competitive price.

Republic Metallurgists worked with Meadow's operating and engineering staff to determine the best wire for each of these specific problems. Applying cost factors to their findings, several types of Republic Manufacturers' Coarse Wire have been selected to produce more than 20 different construction accessories parts. The accurate, easy-forming characteristics of these Republic Wires simplify production. Correct steel chemistry assures adequate strength and toughness.

Snapties or Bookracks, whatever your product, if it's made from wire, Republic's problem-solving metallurgical service is available for you. At your convenience, Republic Metallurgists are ready to work with your personnel in solving production problems . . . and to assist in selection, application and processing of the right wire for the job. Mail the coupon for complete information.

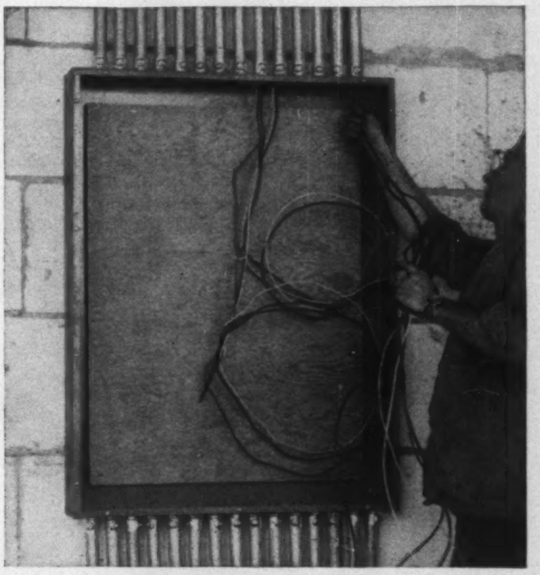
The group of masonry construction accessories, pictured, are among those fabricated from Republic Manufacturers' Coarse Wire by Meadow Steel Products, Inc., Birmingham, Alabama.

SEE OUR EXHIBIT
Steel Arena
1960 METAL SHOW
PHILADELPHIA
OCT. 17-21
BUILD IT BETTER WITH AMERICA'S STEEL

CENTURY SERIES COLD FINISHED STEEL BARS—To meet high strength requirements, and get the exact degree of machinability you need, investigate Republic's Century Series. Each of the five grades of high-strength, stress-relieved, cold finished bars has a minimum yield strength of 100,000 psi. Selecting the grade best suited for your specific application can result in important materials cost reductions. Send the attached coupon for additional information.

CENTURY SERIES C-1144
CENTURY SERIES C-1141
CENTURY SERIES C-1151
CENTURY SERIES C-1050
CENTURY SERIES C-1045

REPUBLIC VACUUM-MELTED METALS—The most extensive facilities in the industry permit Republic to offer vacuum-melted metals in quantity, and in the widest range of sizes and conditions. Billets, plates, sheets, bar, strip, and wire—for applications where reliability is of prime importance. Republic Vacuum-Melted Metals have a consistently high purity, resulting in enhanced mechanical properties . . . ductility, tensile strength, resistance to notch sensitivity, fatigue life, and other properties. Mail coupon for complete data.



REPUBLIC E.M.T. CONDUIT—Keeping pace electrically in your plant becomes more vital each day, as larger, more complex machinery is installed and power demands go up. The easy, economical solution: install Republic ELECTRUNITE® Electrical Metallic Tubing in the next larger size, and you're installing built-in future electrical capacity—at no greater cost than ordinary threaded conduit. With E.M.T. you have a pull-in, pull-out wiring system that can be expanded simply by adding or replacing wire. Send coupon for details.

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☐ Manufacturers' Wire
☐ ELECTRUNITE Electrical Metallic Tubing (E.M.T)
☐ Vacuum-Melted Metals
☐ CENTURY SERIES Cold Finished Bars
☐ Republic's list of free movies—booklet 1177

Name__________ Title__________
Company__________
Address__________
City__________ Zone____ State______

Are You Passing Up $29 to $87 Per Ton Savings?

Enjoy These Spectacular Savings with Bliss & Laughlin's Exclusive Strain-Tempered® Alloy Steel Bars!

Do you buy or specify heat treated alloy cold finished steel bars?

You can save $29 to $87 per ton by substituting Bliss & Laughlin's Strain-Tempered Alloy.

That's a savings on material cost alone of 10% to 25%, without sacrificing the properties wanted most.

There are additional savings, too, depending on the parts you make from heat treated alloy bars.

Machining goes faster with less tool wear. Up to 30% better machinability is common experience.

Heat treatment costs on finished parts are eliminated.

Straightening costs are avoided. There are no distortion problems with Strain-Tempered Alloy Bars.

Pay only for properties needed

Strain-Tempered Alloy Bars meet the same specifications for tensile strength, yield strength, fatigue strength and hardness as heat treated alloy bars with $29 to $87 less cost per ton. For example, in the strength most commonly specified for heat treated alloy bars, Strain-Tempered 4140 and 5150 are produced in all sizes of rounds through 3½" to the following *minimum* specifications:

Tensile Strength	**125,000 psi *Min.***
Yield Strength	**105,000 psi *Min.***
Elongation in 2"	**14% *Min.***
Reduction of Area	**45% *Min.***
Brinell	**269/321**

As can be seen, for 10% to 25% less cost, Strain-Tempered Alloy Bars meet all physical properties most frequently specified.

Strain-Tempered 4140 is also available with the following mechanical properties:

Tensile Strength	**145,000 psi *Min.***
Yield Strength	**125,000 psi *Min.***
Elongation in 2"	**12% *Min.***
Reduction of Area	**40% *Min.***
Brinell	**286/321**

Higher tensile strength levels, approaching 200,000 psi, can be furnished at attractive prices.

You pay only for the properties you actually need. That's why Bliss & Laughlin's Strain-Tempered Alloy Bars are your best buy.

Machinability improved up to 30%

Strain-Tempered Alloy Bars machine up to 30% better than heat treated alloys of the same hardness *including leaded alloys.* This substantial improvement in machinability is, of course, predictable because a pearlite-ferrite micro-structure machines better than tempered martensite at the same hardness.

Comparative tests in Bliss & Laughlin's machinability laboratory show Strain-Tempered Alloy Bars machine with up to one-

third less power consumption, show better chip characteristics, produce cooler parts and assure longer tool life than heat treated alloys at equal hardnesses.

Available in all finishes

Strain-Tempered Alloy Bars are available with these finishes:

Cold Drawn
Ground and Polished
Turned and Polished
Turned, Ground and Polished

Less lead time required

Lead time is substantially less than required for regular heat treated alloy bars. This is another big advantage of specifying Strain-Tempered Alloy Bars. Strain-Tempered Alloy Bars are usually manufactured to customers' specifications. However, some of the most commonly used grades in popular sizes will soon be available at Steel Service Centers, which have stocked Strain-Tempered Carbon Bars for years.

What are Strain-Tempered Bars?

Strain-Tempered Alloy Bars are manufactured by a special process of drawing and furnace treatment. This produces strength and hardness levels usually obtained only by quench-and-temper heat treatment. Furnace aging at the ideal temperature for at least four hours in large, modern annealing furnaces assures maximum uniformity and minimum distortion.

Pioneered by Bliss & Laughlin

High-strength, furnace-treated steel bars were pioneered by Bliss & Laughlin over 30 years ago. Today, Strain-Tempered bars are produced in both alloy and carbon grades.

The first Strain-Tempered bar was delivered in 1929 for automobile drive shafts. Large quantities of Strain-Tempered Alloy Bars are now being furnished for drive shafts, as well as for many other products.

Nearly 70 years of research and development leadership back Bliss & Laughlin's Strain-Tempered production.

Investigate your savings now

A Bliss & Laughlin representative will recommend the most suitable, least costly grade. He will present tangible evidence, without obligation, of how Strain-Tempered Alloy Bars can cut your material and production costs. Contact your nearest Bliss & Laughlin sales office or mill today.

SAVES $64/TON

TRUCK BODY PIN

2¼″ round 4140 heat treated, stress relieved, 269/321 Brinell. Strain-Tempered 5150 saves $64.00 per ton.

SAVES $49/TON

WINCH SHAFT

1¾″ round 5150 heat treated, stress relieved, Drawn, Ground and Polished, 262/311 Brinell. Strain-Tempered 5150 reduces material costs $49.00 per ton.

SAVES $87/TON

MACHINERY SHAFT

2¾″ round 4140 leaded, heat treated, stress relieved, 269/321 Brinell. Strain-Tempered 5150 saves $87.00 per ton.

SAVES $49/TON

STUD

1½″ round 4140 heat treated, stress relieved, 240/283 Brinell. Strain-Tempered 4140 cuts $49.00 per ton from material costs.

SAVES $29/TON

CHROME PLATED HYDRAULIC PISTON ROD

2.252/2.258″ round 4140 heat treated, 269/321 Brinell. Strain-Tempered 4140 lowers costs $29.00 per ton.

SAVES Added Costs

MACHINE TOOL SHAFT

1½″ round 4140 annealed and cold drawn, then heat treated and straightened after fabrication. Strain-Tempered 4140 saves the cost of heat treatment and straightening.

Specialists in Finish, Accuracy, Straightness, Strength and Machinability

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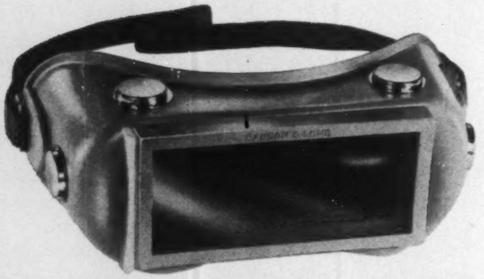
GENERAL OFFICES: Harvey, Ill. • MILLS: Harvey, Detroit, Buffalo, Los Angeles, Seattle, Mansfield, Mass.

Leading Independent Producer of Cold Finished Steel Bars

S-42 Chippers Goggle
with flat, or 6:00D
Bal-SAFE lenses, clear
or in Ray-Ban shades 1, 2 or 3.

W-35 Chippers Eyeshield
with two Enduron 2"x4¼" plates;
gives increased protection
and provides air space
which further reduces fogging.

S-41 Welders Goggle with
Arc-Ban lenses in shades No. 3
through No. 6, with tough
Enduron plastic cover lenses.



W-36 Welders Eyeshields with
2"x4¼" Arc-Ban welding plate,
shades No. 3 through No. 6, with
Enduron cover plate.

RARE NEW COMFORT, ADDED PROTECTION, IMPROVED VISION

Bausch & Lomb Chippers and Welders

FLEXIBLE GOGGLES AND EYESHIELDS

Insure workers a greater degree of safety than ever before; give them more comfort, better vision. Insure more worker cooperation, too, because these goggles and eyeshields are so good looking in their new opaque flesh color and bright nickel louvers, vents and head bars! Soft and flexible, they fit snugly, comfortably. Eyeshield plates are replaced in seconds through side opening. Goggle head bars are adjustable as are two-tone elastic headbands. For more details, prices, write today:

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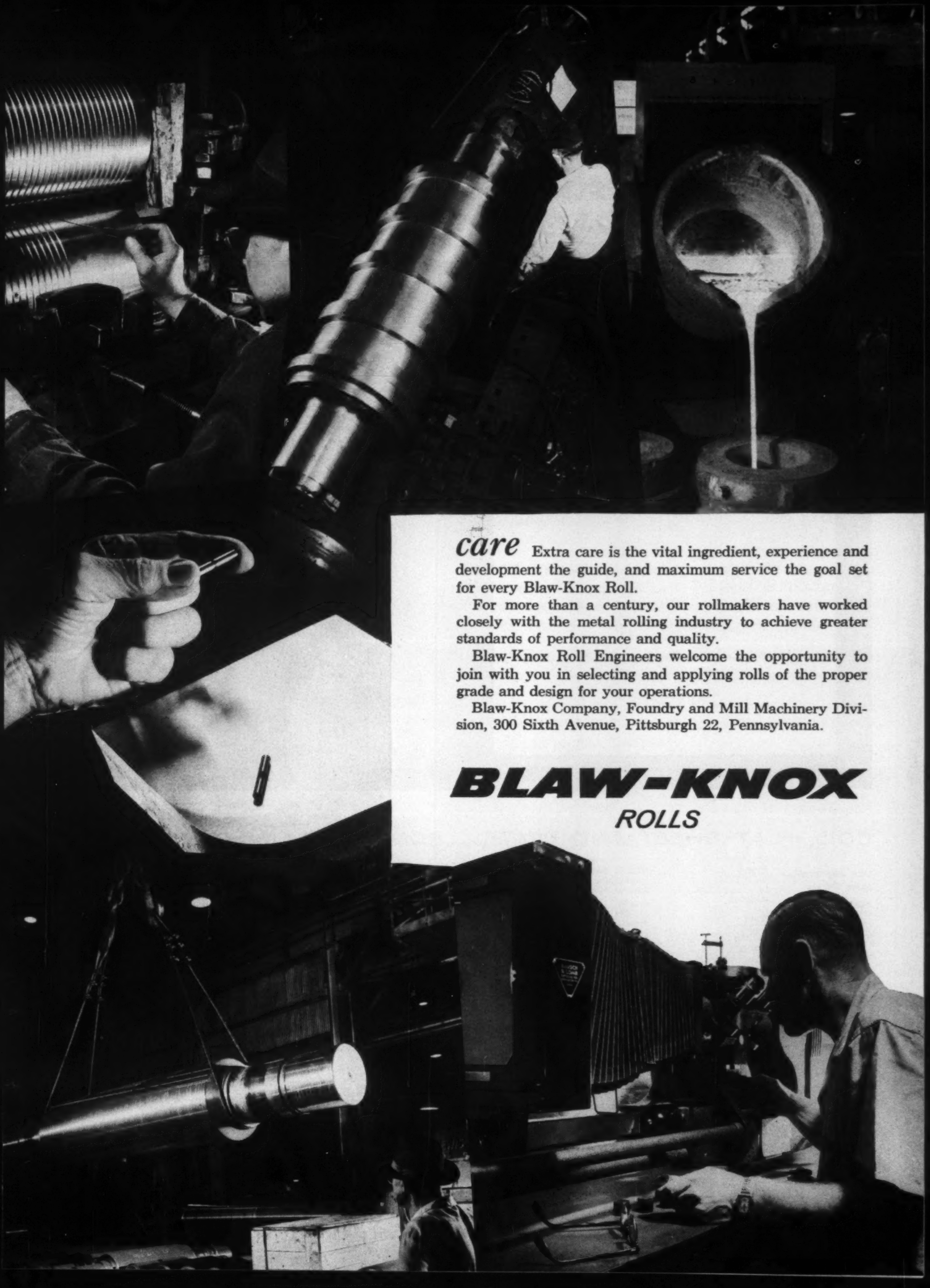

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For more than a century, our rollmakers have worked closely with the metal rolling industry to achieve greater standards of performance and quality.

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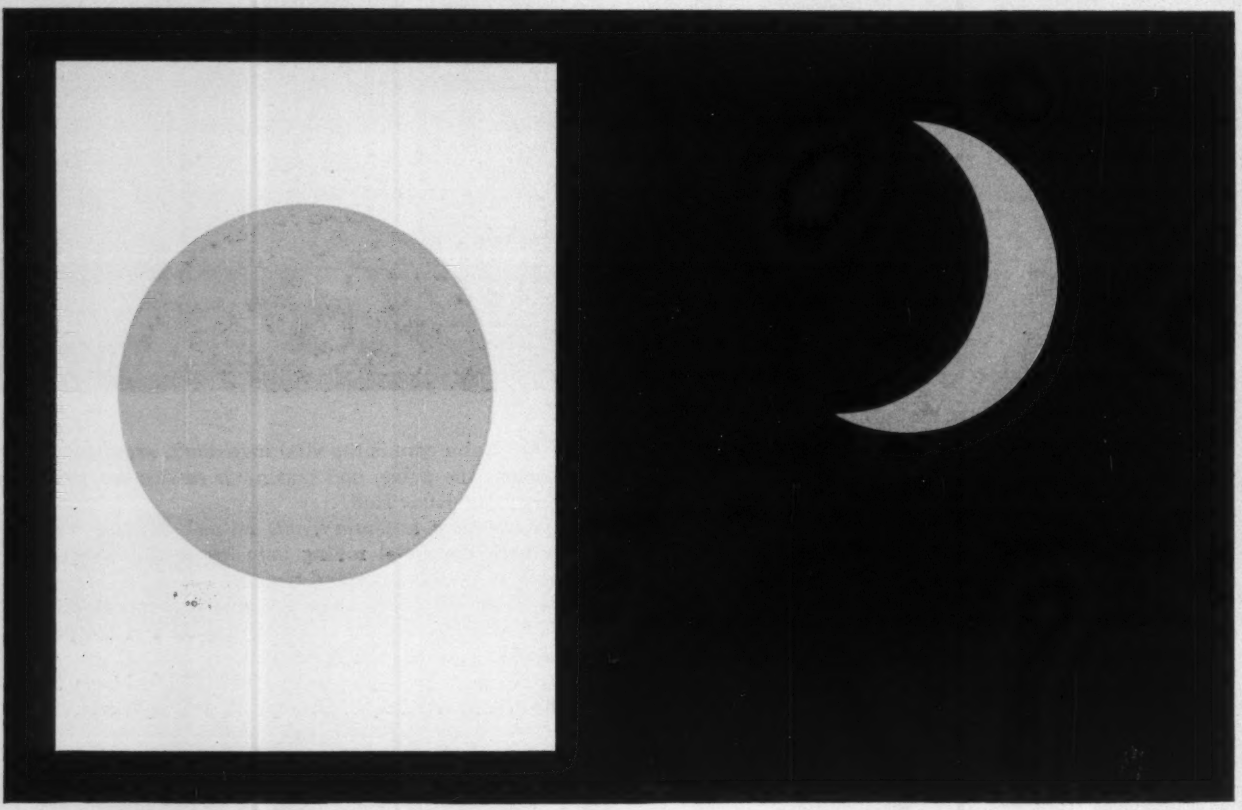

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YUkon 2-9434

COLORADO
DENVER
FLorida 5-0371

CONNECTICUT
NEW HAVEN
SPruce 7-1491

FLORIDA
MIAMI
PLaza 7-0635

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ATLANTA
TRinity 5-9231

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CHICAGO
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INDIANA
INDIANAPOLIS
MElrose 5-7613

SOUTH BEND
CEntral 3-8737

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PLaza 3-2055

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TWinbrook 5-8015

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LIberty 9-5500

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CLEVELAND
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RIverside 3-2660

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(Bala Cynwyd)
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DALLAS
FLeetwood 7-1591

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Atlantic Steel Co.
WOrth 1-2147

CALIFORNIA
BERKELEY
A. M. Castle & Co.
THornwall 5-2210
LOS ANGELES
A. M. Castle & Co.
LUdlow 9-6611

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(rod, bar, extrusions)
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RAymond 3-4581
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KEystone 4-5151

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EDison 4-4191

FLORIDA
FT. LAUDERDALE
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LUdlow 3-7650
MIAMI
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PLaza 4-2754

ORLANDO
Caulley Steel & Supply Co.
GArden 5-3528

GEORGIA
ATLANTA
Atlantic Steel Co.
TRinity 5-3441

ILLINOIS
CHICAGO
A. M. Castle & Co.
NAtional 5-6411
CHICAGO
Guardian Aluminum Sales, Inc.
NAtional 2-5808
CHICAGO
Lafayette Steel & Aluminum Corp.
LAfayette 3-7632

ROCKFORD
A. M. Castle & Co.
WOodland 8-2211

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NEW ORLEANS
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MASSACHUSETTS
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Kelco Metal Products Co.
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WORCESTER
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MICHIGAN
DETROIT
Production Steel Products, Inc.
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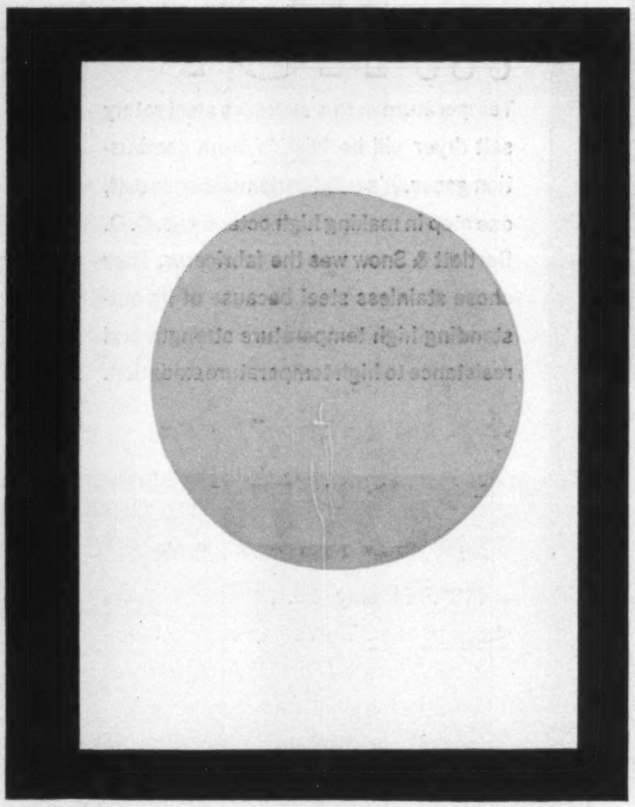
YOUR OLIN ALUMINUM DISTRIBUTOR SAYS:

"ORDER TODAY... METAL TOMORROW"



When you need aluminum, and need it now, your sure bet for service is to call your Olin Aluminum distributor. On the same or the following day, the sheet, the extrusions, the casting alloys, or the screw machine stock you asked for, will be on the way to your shop, ready to fabricate.

You won't have to settle for "just-as-good" specifications, either. You get the alloys, tempers, gauges and sizes you ask for. In common alloy sheet. In heat-treated sheet. In extrusions (over 400 shapes to choose from). In cold processed rod and bar—obtainable only from Olin Aluminum and its distributors, and offering finer grain, improved machinability and better finishing characteristics.

In short, if you're a stickler for service—it's time you called your Olin Aluminum distributor. Make him your metals service center for both ferrous and non-ferrous products. You'll get—

- Quick, effective, custom-tailored service
- Extra plant space and working capital by minimizing your inventories
- Technical service backed by Olin Aluminum's metallurgical facilities
- Slitting, shearing and roller-levelling service—in most cases.

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CLEVELAND
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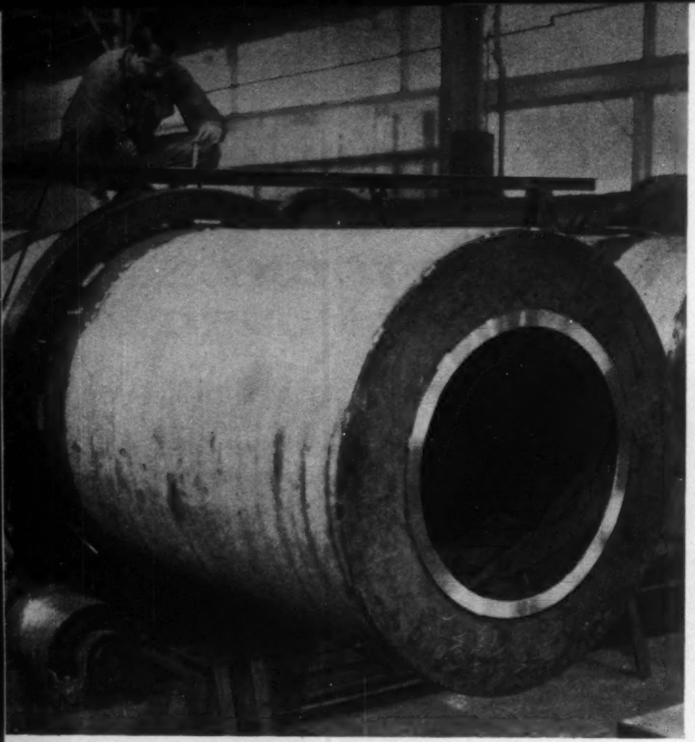

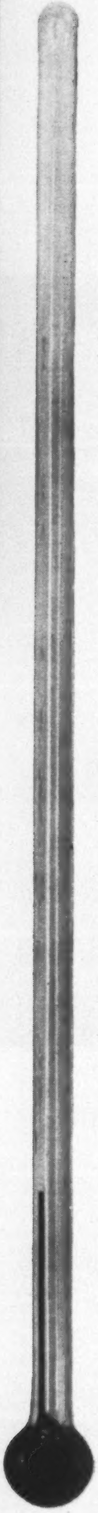

...HOT

Temperature in this stainless steel rotary salt dryer will be 1600°F from combustion gases. It's used to demoisturize salt, one step in making high octane gas. C. O. Bartlett & Snow was the fabricator. They chose stainless steel because of its outstanding high temperature strength and resistance to high temperature oxidation.

COLD...

—443°F is only 16.4 degrees above absolute zero. That's one reason stainless steel is used in this heat transfer unit that helps simulate outer space conditions of near absolute zero temperature and one-billionth of an atmosphere. The all-stainless unit is named "PLATECOIL," manufactured by Tranter Manufacturing, Inc., Lansing, Michigan.

This mark tells you a product is made of modern, dependable Steel.

...and in between

No material can match stainless steel's versatility. Stainless steel offers designers and fabricators a unique combination of properties: superior strength, extraordinary corrosion resistance to an enormous variety of reagents, outstanding high temperature properties, and appearance. It is easily fabricated and, because stainless steel lasts longer, actually costs less in the long run. If you have a selection or delivery problem, ask your USS representative or nearest steel service center.

USS is a registered trademark

United States Steel Corporation — Pittsburgh
American Steel & Wire — Cleveland
National Tube — Pittsburgh
Columbia-Geneva Steel — San Francisco
Tennessee Coal & Iron — Fairfield, Alabama
United States Steel Supply — Steel Service Centers
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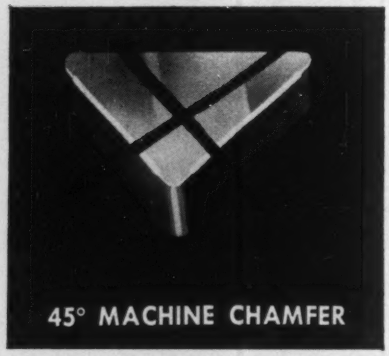
Metallurgical Memo from General Electric

GENERAL ELECTRIC ANNOUNCES PRE-HONED

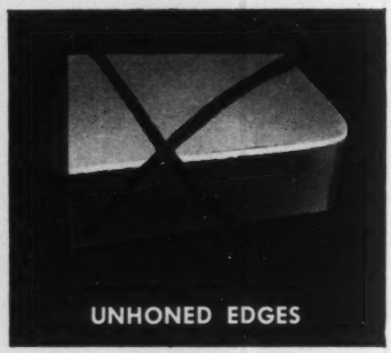
Now you get more predictable tool life... lower cost per cutting edge ... no hand-honing cost!

HAND HONING

Hand-honing is inaccurate, time-consuming—often results in premature chipping and breaking.


45° MACHINE CHAMFER

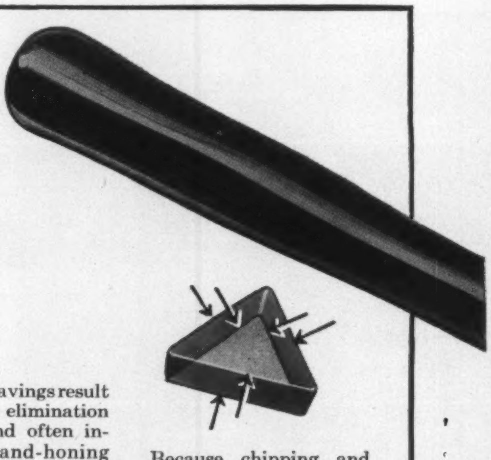
Chamfered, or ground-flat, edges are geometrically weaker than a radius and are more easily chipped or broken.


UNHONED EDGES

Unhoned or as-ground inserts show rough edges—result in unpredictable tool life due to chipping.

Pre-honed inserts with uniform, precise honed edges offer top strength; improve tool life predictability.

Additional savings result through the elimination of costly and often inaccurate hand-honing methods.



Because chipping and breaking are minimized, pre-honed Carboloy inserts result in lower average cost per cutting edge.

TOPS IN TOOLING QUALITY

From the research and quality-control facilities of the Metallurgical Products Department of General Electric comes the outstanding quality tooling line in the metalworking industry. The new Carboloy pre-honed inserts, as well as the complete line of Carboloy toolholders, inserts, insert seats, convertible seats, and brazed tooling, are designed to meet every tooling need efficiently and economically.

CARBOLOY® INSERTS

Delivered ready-to-use . . . honed to a precise radius . . . promise BETTER PROFITS THROUGH BETTER TOOLING

Now General Electric Carboloy inserts are pre-honed *at the factory!* Here's what it means to you:

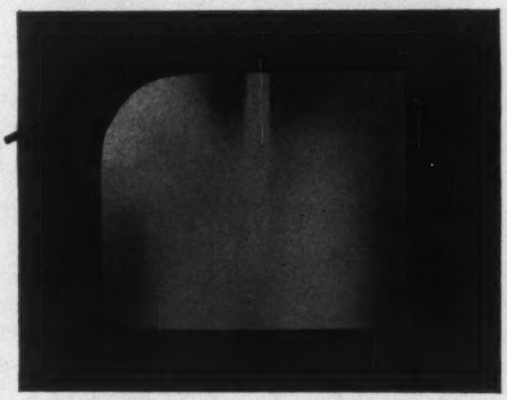
1. An insert with edges honed to precise *radii* gives the strongest geometric shape to withstand cutting pressures. This reduces the chance of chipping—increases the predictability of tool life. Hand honing *cannot* achieve precise radii—G-E pre-honing can . . . and does!

2. Since chipping is minimized, fewer cutting edges are wasted. The result is lower cost per cutting edge.

3. Since inserts come pre-honed and ready-to-use, the labor cost and inaccuracies of hand honing are eliminated. This more than offsets the additional charge for pre-honing.

4. Pre-honed Carboloy cemented carbide inserts have standard edge radii honed to a greater or lesser degree, depending on the job to be done. You'll *know* the honing is right!

Ask your Authorized Carboloy Distributor about pre-honed Carboloy inserts, convertible seats, toolholders, and brazed tools. Or, write directly to: *Metallurgical Products Department of General Electric Company, 11153 E. 8 Mile Street, Detroit 32, Michigan.*



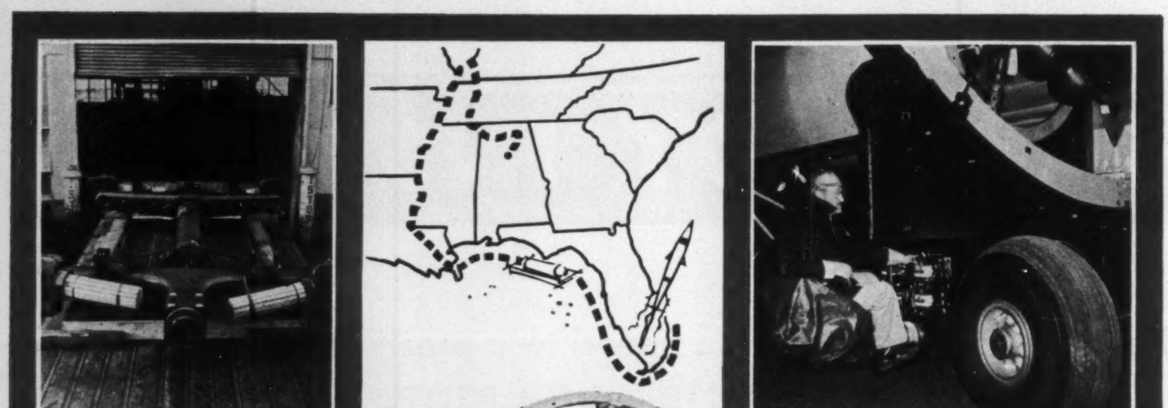
Shown here, both under magnification and graphically, is an edge of the new Carboloy pre-honed insert. Radius is geometrically ideal to minimize chipping, extend tool life many times.

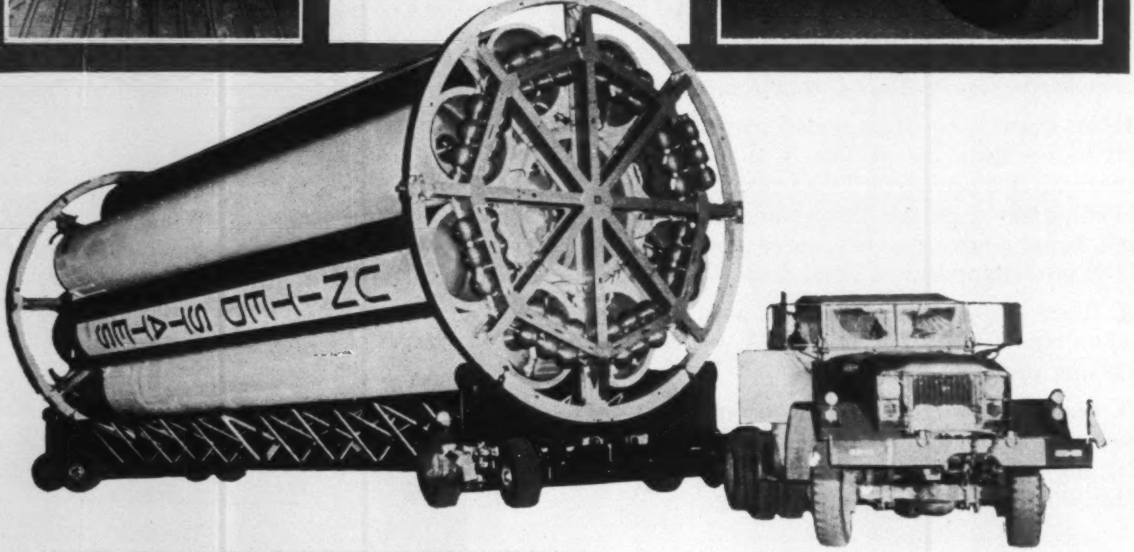
CARBOLOY.
CEMENTED CARBIDES

METALLURGICAL PRODUCTS DEPARTMENT

GENERAL ELECTRIC

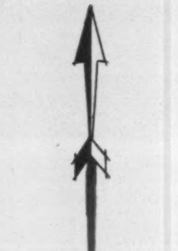
CARBOLOY® CEMENTED CARBIDES • MAN-MADE DIAMONDS • MAGNETIC MATERIALS • THERMISTORS • THYRITE® • VACUUM-MELTED ALLOYS





GIANT TRANSPORTER FEATURING ACIPCO "WALKING BEAM ASSEMBLIES" WILL HELP...

Saturn's conquest of space



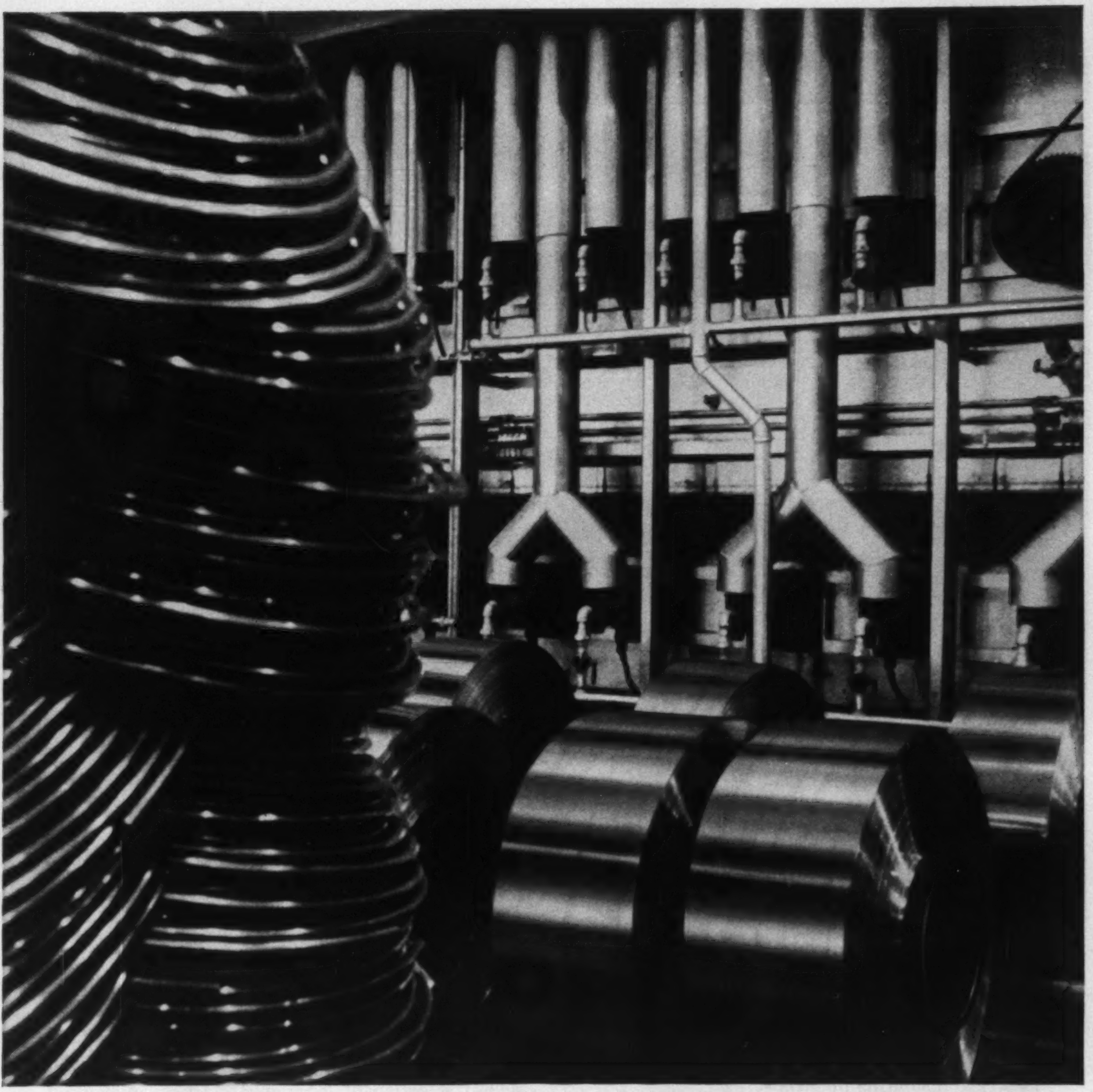
The moment draws near when America's Saturn rocket will thunder into space. But in the meantime, elaborate ground preparations are now taking place.

From the N.A.S.A. Marshall Space Flight Center in Huntsville, Alabama, via a circuitous land and water route to the launching site, the missile and its valuable cargo will be gently cradled on the huge transporter shown here. Acipco walking beam assemblies (upper left) are vital parts of this transporter.

These rugged assemblies are constructed of high strength alloy steel and comprise centrifugally spun and statically cast component parts . . . all produced at Acipco. Also, all precision machining and intricate fabrication work were done by skilled Acipco personnel.

While your tubular product application may not be destined for outer space, Acipco's production "know how" and complete "under one roof" facilities can assist you, too. Your inquiry is invited.

ACIPCO
SPECIAL PRODUCTS
DIVISION OF ACIPCO AMERICAN CAST IRON PIPE CO.
BIRMINGHAM 2, ALABAMA



American Brass relies on GAS for precise control in heat processing

Five huge gas-fired furnaces handle heat processing at the new American Brass Company plant near Los Angeles—largest copper and brass mill in the West.

Gas heat anneals their copper and brass coils, tubing and strip . . . processes copper billets for extrusion and for piercing . . . and bright-finish anneals copper coils and tubing.

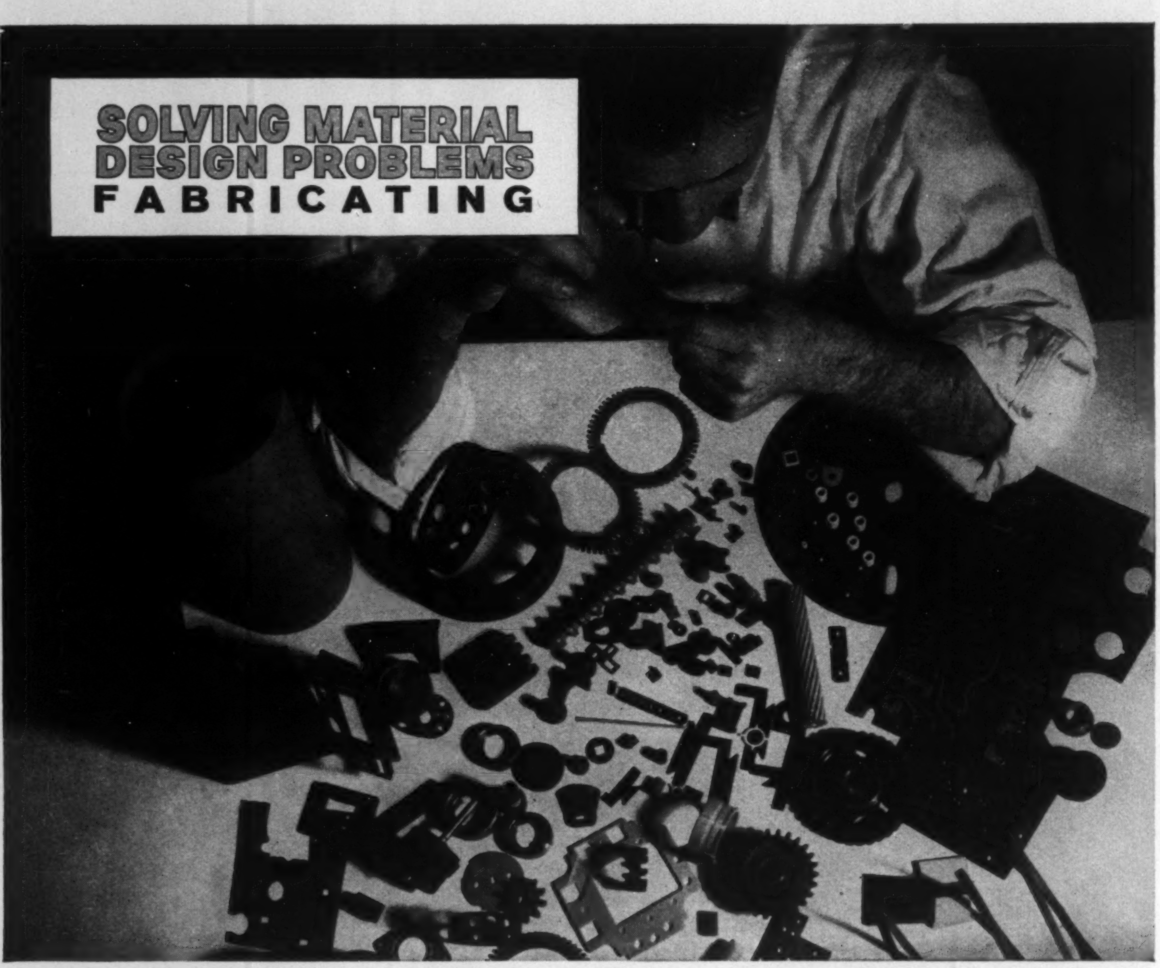
Why the choice of gas heat? Precise temperature control! Gas heat develops the required temperatures rapidly. Maintains them precisely. Adapts most easily to automatic temperature control. Offers unbeatable fuel economy.

Multi-purpose, gas-fired, radiant tube, forced circulation roller hearth furnace at American Brass Company's new Los Angeles mill. Used in the bright finish annealing of copper coils, tubing and strip.

American Brass, and thousands of other companies, can tell you *gas* is technically right and economically sound for all types of heat processing. Call the Industrial Sales Engineer at your local gas company. *American Gas Association.*

FOR HEAT PROCESSING GAS IS GOOD BUSINESS!

SOLVING MATERIAL DESIGN PROBLEMS
FABRICATING



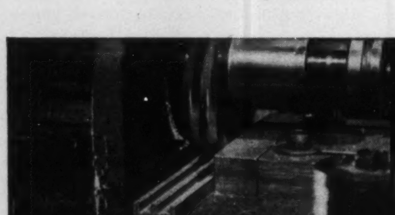
Buy the parts not the problems. From large and unusual shapes to parts so small you inspect with a jeweler's glass... CDF's special fabricating facilities can do your job faster, more economically. Every part shown above is fabricated by CDF, except the etching of the printed circuits.

There's an excellent chance you can save on set-up and production time, and reduce unit costs by asking CDF to give you an estimate on final fabrication of laminated plastics, vulcanized fibre and electrical insulating materials.

Our machines, all 2,000 of them, are set up for just one purpose—the forming, machining and molding of the many types of materials that we produce.

Most important of all, you can combine economy with the exact properties you're looking for. CDF offers you a choice of materials from the industry's widest selection of laminated plastics, vulcanized fibre and electrical insulating materials. Check your Sweets PD file or write for General Folder 60.

CDF
CONTINENTAL-DIAMOND FIBRE
® A SUBSIDIARY OF THE Budd COMPANY • NEWARK 85, DEL.
In Canada, 46 Hollinger Road, Toronto 16, Ont.



Machining low-cost tracks for sliding glass doors. Made by CDF from Diamond vulcanized fibre. It's tough, yet light in weight.

Molding automobile timing gear blanks made from CDF's Celoron molding material for maximum wear and a minimum of noise.

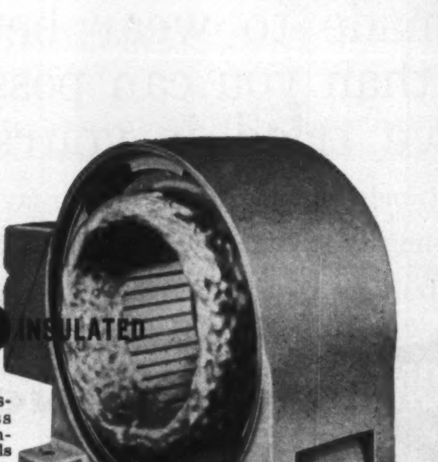
Postforming back-up disc for a sander. Made from a Dilecto laminated plastic to get maximum toughness and resiliency.

A complete line of integral HP motors: dripproof protected—totally enclosed—and explosion proof

ELLIOTT C-W MOTORS

conservatively designed, ruggedly built, highest quality throughout

The extra service users enjoy from Elliott C-W motors is due to the conservative design, precision manufacture and high-quality materials of these machines. For most applications, the dripproof-protected type gives dependable service. Where conditions are more severe the totally-enclosed or explosion-proof construction may be required. Recently added to the line are the EPA-SEAL epoxy insulated C-W motors for service where moisture or corrosive atmospheres demand superior insulation.

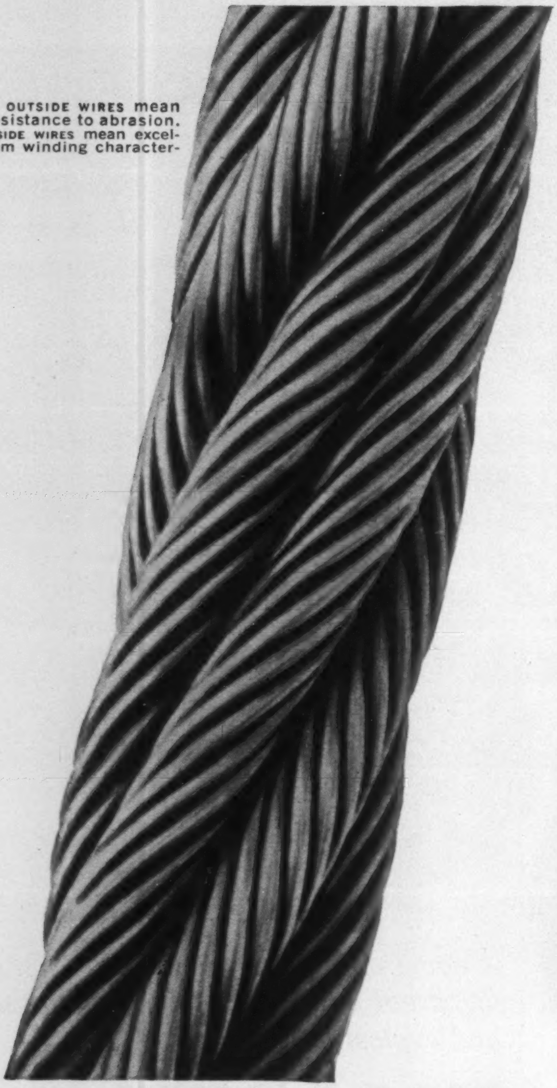


EPA-SEAL INSULATED

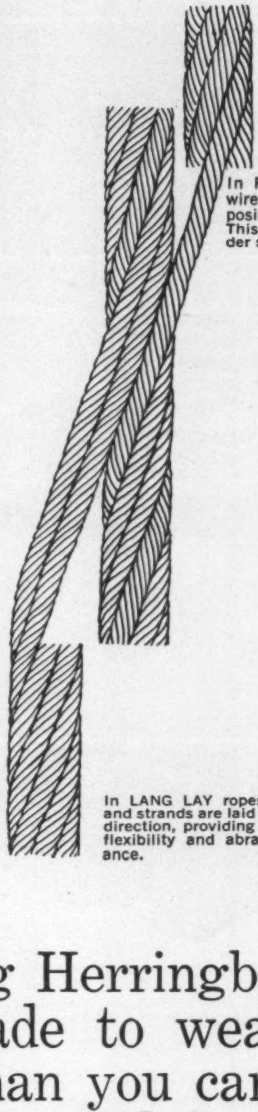
Vacuum-pressure process thoroughly impregnates coils with epoxy resin.

ELLIOTT Company
Crocker-Wheeler Plant
Jeannette, Penna.

WO-2



HEAVIER OUTSIDE WIRES mean great resistance to abrasion. FINER INSIDE WIRES mean excellent drum winding characteristics.



In REGULAR LAY ropes the wires are laid in a direction opposite to the lay of the strands. This provides stability even under severe operating conditions.

In LANG LAY ropes the wires and strands are laid in the same direction, providing exceptional flexibility and abrasion resistance.

Two ropes in one! Roebling Herringbone® Wire Rope is designed and made to wear better, work better, last longer than you can possibly imagine . . . unless you've tried it yourself!

Herringbone combines two pairs of Lang Lay strands with one pair of regular lay strands to give you maximum flexibility, good stability, mighty strength. Call your Roebling Distributor — or write for details to Roebling's Wire Rope Division, Trenton 2, N. J.

HERRINGBONE
WIRE ROPE

ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation

"Very pleased with all the advantages offered by Tri-Lok. Always prefer shipments to be made in this form due to handling ease, safety and convenience."

NEW YORK SMELTER

"TRI-LOK ingots cut our unloading time quite a bit. They don't shift in bundles . . . but stay in place for easy storing and fork-lift handling."

MIDWEST ALUMINUM PRODUCTS MANUFACTURER

"ALCAN TRI-LOK ingots arrive compact and stay compact until we use them. They stack safely, stably—even three or four bundles high. And when straps are cut, they stay in place until fork-lift pickup."

CALIFORNIA EXTRUDER

"We're very enthusiastic about new ALCAN TRI-LOK ingots. Always liked Alcan ingot anyway . . . even more so with Tri-Lok. Mainly from point of view of stacking and handling."

EASTERN EXTRUDER

Despite the stability of Tri-Lok bundles, there's never a separation problem—*just lift to separate!*

Here are some typical examples of what users are saying about Aluminium's newest ingot development—ALCAN Tri-Lok ingot.

Designed for more efficient handling, the new ingots lock one to another, not in just one, but in three different ways. The resultant stability means greater speed, simplicity and safety wherever ingots are handled.

In car unloading, you find bundles arrive in excellent condition ready for quick pickup by fork lift truck. In-plant moves, too, are greatly simplified because no pallets or special slings are needed. Even after strap removal, Tri-Lok bundles remain securely intact on trucks, floors or inclined ramps.

See for yourself how Tri-Lok ingots improve worker safety . . . save time in carrying, storing and remelt charging. Just telephone or write us today.

Aluminium Limited

ALCAN

Ingot Specialist...serving American Aluminum Fabricators—

In the U.S.—Aluminium Limited Sales, Inc., 630 Fifth Avenue, New York 20, N.Y.

CLEVELAND • CHICAGO • LOS ANGELES • DETROIT • ATLANTA • ST. LOUIS

Another example of National Roll quality control

John Patton, National's assistant sales manager and Joe Marsalka, metallurgist, look over the reflectoscope "profile" of a steel roll.

No flaw escapes this electronic eye!

Your steel rolls from National are given a thorough examination by reflectoscope before shipment. Ultra-high frequency sound waves traverse every segment of the roll, electronically assuring the absence of internal flaws which might shorten the roll's service life in your stand.

This attention to detail and emphasis on high quality of product are two reasons why more and more steel makers are turning to National for their steel, iron and nodular iron rolls. From the moment you call a National representative, your roll problem gets the *personalized* attention of men experienced in analysis, design and production.

We'd like to tell you more about how National Roll's expanded staff and facilities can serve you. Next best thing to a visit with us is a look at our new brochure. May we send you a copy? It helps explain why . . .

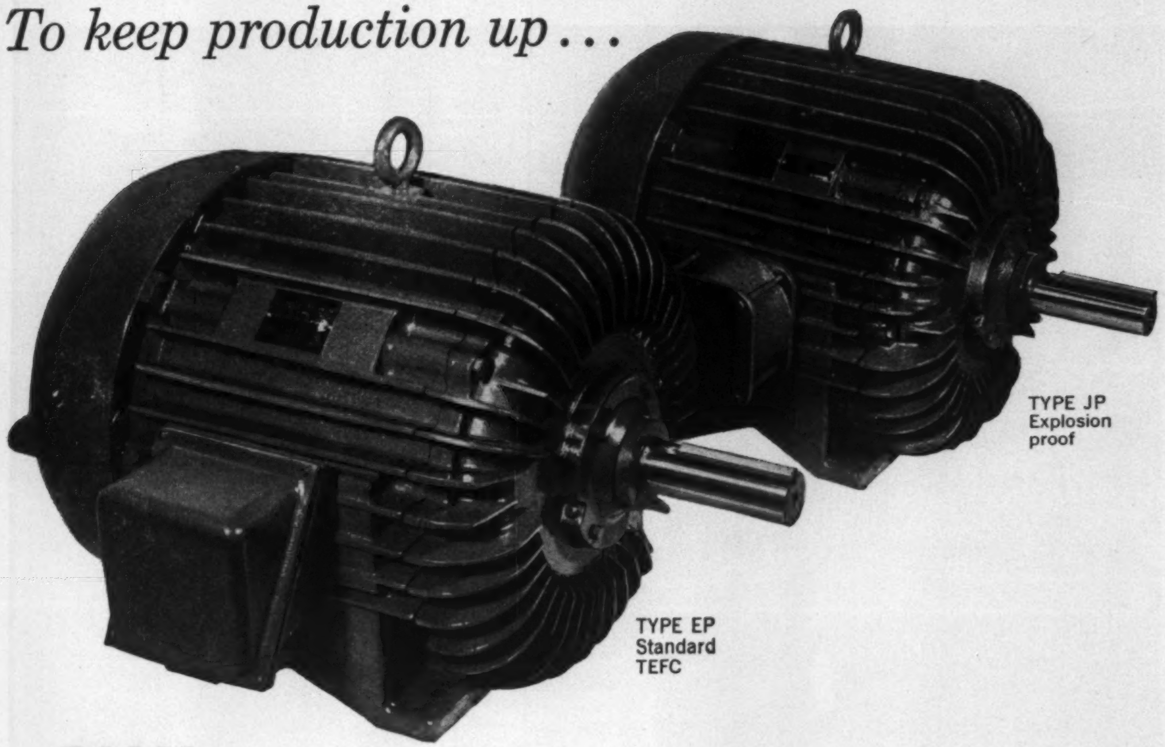
National's the growing name in rolls

NATIONAL ROLL & FOUNDRY DIVISION

GENERAL STEEL CASTINGS CORPORATION, Avonmore (Westmoreland County), Pa.

General Steel Castings Corporation, General Offices: Granite City, Illinois • Plants: Granite City, Ill., Eddystone, Pa., Avonmore, Pa.

To keep production up . . .



PICK FROM THIS PROTECTED PAIR...

Here's a power-packed pair of Wagner® totally-enclosed fan-cooled motors —Type EP, standard, protected against damage from dust, abrasive, fumes, steel chips or filings; and Type JP, explosion-proof, for safe use in specified hazardous locations.

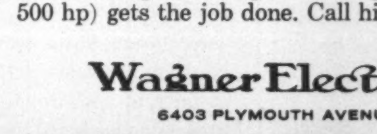
They'll keep your production rates up, delivering full rated horsepower under the toughest conditions . . . staying on the job with dependable, continuous service that means peak output. They're the perfect pick, for individual machines or for automated lines.

In the design illustrated, these motors are built in ratings through 100 hp in NEMA frame sizes 182-445U. Let your Wagner Sales Engineer show you how this protected pair (or larger Wagner enclosed motors through 500 hp) gets the job done. Call him, or write us for Bulletin MU-224.

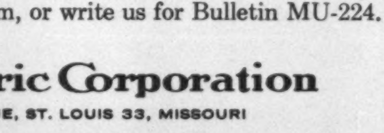
Wagner Electric Corporation
6403 PLYMOUTH AVENUE, ST. LOUIS 33, MISSOURI

WM60-19

HEAVY-DUTY BALL BEARINGS . . . The ball bearings used in these motors are of the highest quality, with more than ample capacity to provide long, troublefree service under heavy loads.

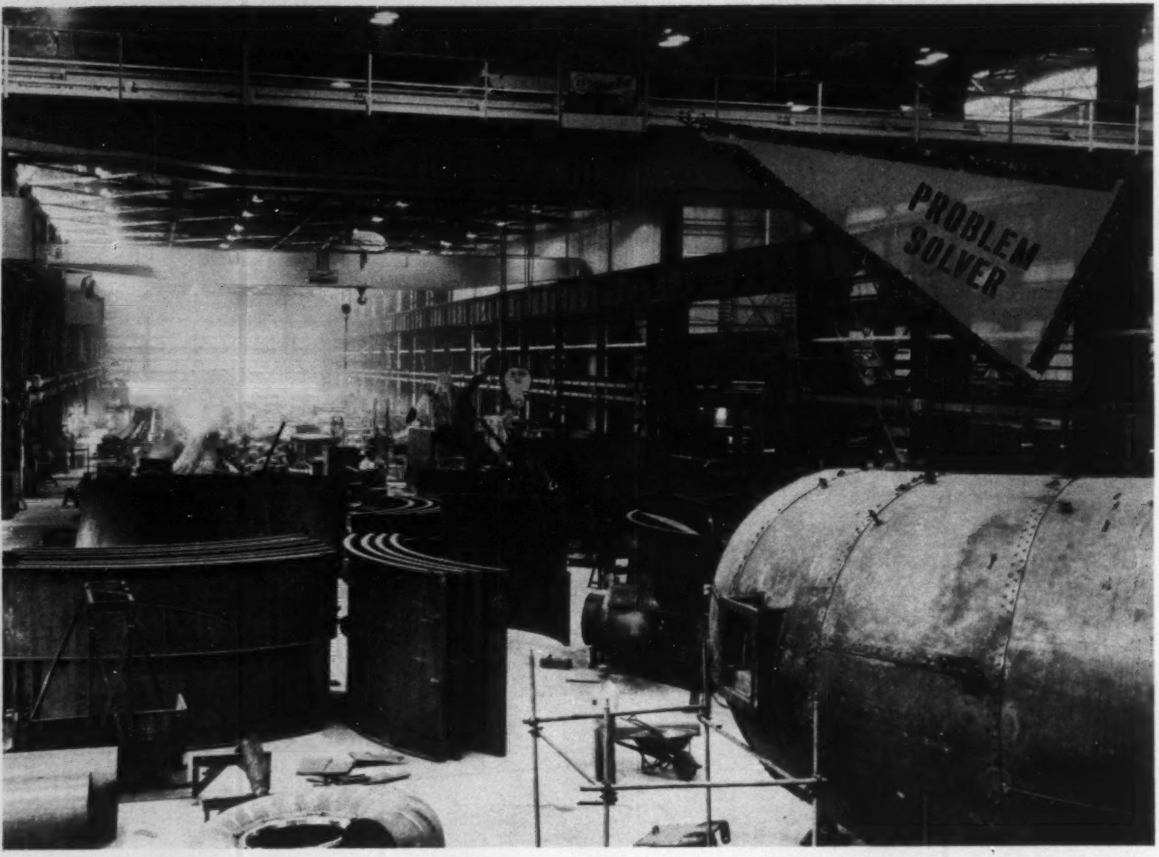


BEARINGS CAN BE RELUBRICATED . . . Factory lubrication will last for many years under normal service, but openings are provided to permit relubrication that adds years to motor life under severe conditions.

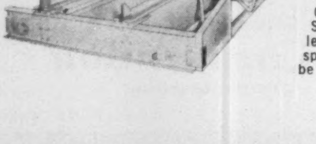


SECURELY SEALED FOR LOW MAINTENANCE . . . Both ends of these motors have running shaft seals to keep the bearings clean. Bearing housings are effectively sealed to prevent escape of grease.

VISIT WAGNER BOOTH 260 AT THE PRODUCTION ENGINEERING SHOW



Production gets a multiple-shift lift from Shaw-Box® Cranes



Series "D" Shaw-Box Crane. For average industrial service. Components are mass produced to permit lower prices. Capacities to 20 tons. Spans to 80 feet. Selection of type, size, span, and control can be made from a catalog.

Type "SC" Shaw-Box Crane Bridge for heavy duty service with standard "SC" trolley. Rigidly constructed to eliminate whipping and skewing. Crane has highest hook lift. Capacities to 40 tons.

Shaw-Box Bucket Magnet Crane. This type has special advantages in steel mill services. Shaw-Box builds cranes of every type in every capacity to 500 tons.

At York, Pa. Allis-Chalmers Manufacturing Company engineers the unusual in hydrodynamics. Giant hydraulic turbines and their accessory water control equipment are designed and produced here.

Two 25-ton Shaw-Box Cranes help solve some of the tough handling problems in Plant No. 2. They carry steel plates and castings to and around in the fabricating area for layout and processing into subassemblies of draft tube liners, spiral casings, pit liners, and special products.

Multiple shifts are normally working at Plant No. 2. The cranes operate under diverse conditions. At one moment, each may be handling a piece that's too heavy for a man. Then both cranes may work together at their combined capacities. Clearing the largest assemblies is no problem for these low headroom cranes.

Shaw-Box Cranes are solving overhead load handling problems for all industry. Whatever type and capacity you require, Shaw-Box will engineer and build your crane to give the utmost in performance, economy, and safety. Your inquiry is invited.

SHAW-BOX CRANES
A Product of
MANNING, MAXWELL & MOORE, INC.
Shaw-Box Crane & Hoist Division • Muskegon, Michigan
In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario

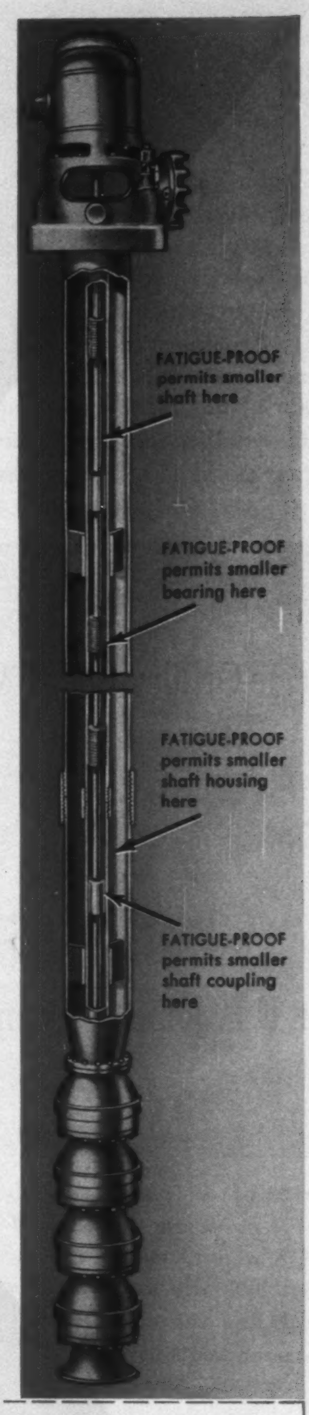
60 D-1

Salt River Valley Water Users Association,
Phoenix, Arizona

Saves $699.00 per pump...

by using ground and polished

fatigue-proof®
STEEL BARS
e.t.d.®
made by elevated temperature drawing process


FATIGUE-PROOF permits smaller shaft here
FATIGUE-PROOF permits smaller bearing here
FATIGUE-PROOF permits smaller shaft housing here
FATIGUE-PROOF permits smaller shaft coupling here

The men who operate the "Salt River" project have the job of supplying water to 240,000 acres of land in Arizona, where the Gila River joins the Salt River. The Association maintains some 250 deep well pumps to help supply the required water.

Richard Juetten, Supervisor of Salt River's Pump Division, reports that the use of La Salle FATIGUE-PROOF steel bars has permitted a saving of $699.00 per pump . . . a potential saving of $174,750 when applied to the 250 pumps now in operation.

Mr. Juetten's report follows:

"I have figured our direct saving realized by using La Salle FATIGUE-PROOF steel bars in place of standard C-1045 steel shaft in our deep well turbine pumps.

"FATIGUE-PROOF enables us to use bars only $1\frac{11}{16}''$ in diameter . . . instead of $2\frac{3}{16}''$ diameter shafts which were necessary when we used C-1045 . . . and this despite higher horsepower, more weight, and additional pump bowl assemblies.

"Here are comparative costs per 10-foot section (of a 300-foot pump shaft):"

using C-1045	
10′ x 2-3/16″ dia. shaft	$28.30
3½″ shaft housing	26.30
2 bearings, 3½″ x 2-3/16″	21.72
Shaft coupling	5.16
TOTAL cost	$81.48
Cost per foot	$ 8.15

using FATIGUE-PROOF	
10′ x 1-11/16″ dia. FATIGUE-PROOF	$22.59
3″ shaft housing	19.80
2 bearings, 3″ x 1-11/16″	13.46
Shaft coupling	2.34
TOTAL cost	$58.19
Cost per foot reduced to	$ 5.82

RESULT: A saving of $2.33 per foot ... or $699.00 when applied to a 300-foot pump setting. And this doesn't take into consideration reduced power consumption.

See us at PRODUCT ENGINEERING SHOW
Booth No. 147-149-151

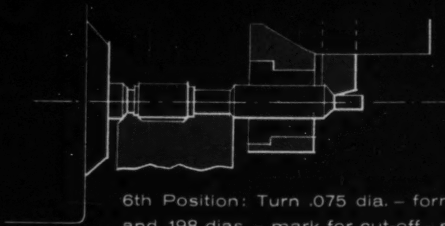
La Salle STEEL CO.

1436 150th Street
Hammond, Indiana

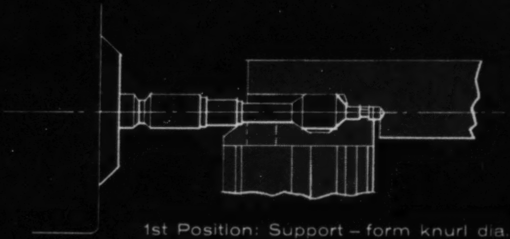
ASK FOR 24-PAGE BOOKLET—It tells the complete story of FATIGUE-PROOF®

name________________
title________________
company________________
address________________
city and zone__________ state__________

Mail to La Salle Steel Company, 1436 150th Street, Hammond, Indiana



6th Position: Turn .075 dia. – form .165 and .198 dias. – mark for cut-off – support

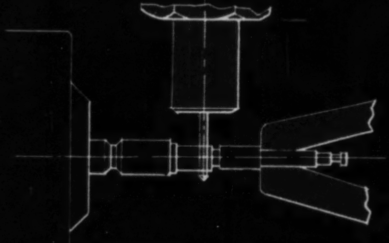


1st Position: Support – form knurl dia., .055 and .075 dias.

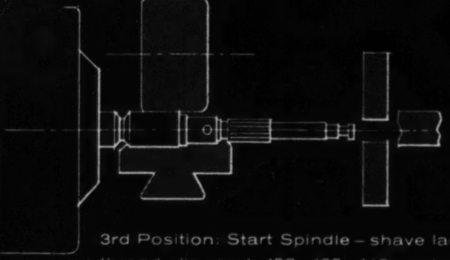
Acme-Gridley Speed & Accuracy...

SLASHES TOTAL MACHINE TIME 76.4%

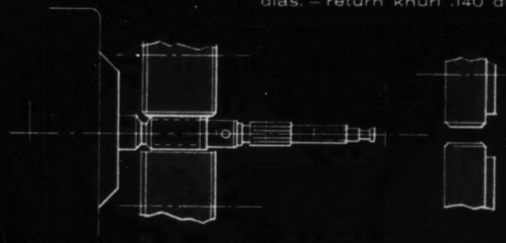
for E.F. Johnson Company



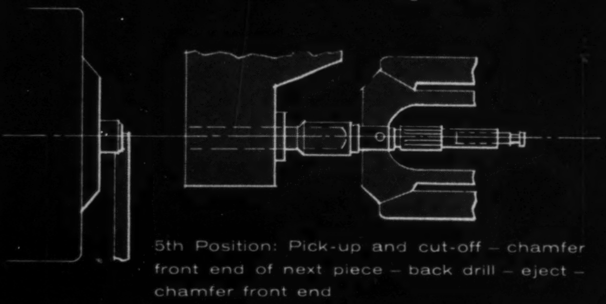
2nd Position: Stop spindle – cross drill – hollow-mill small thread dia.



3rd Position: Start Spindle – shave large thread dia. and .198, .165, .140 and .130 dias. – return knurl .140 dia. face end



4th Position: Chase small thread – roll large thread

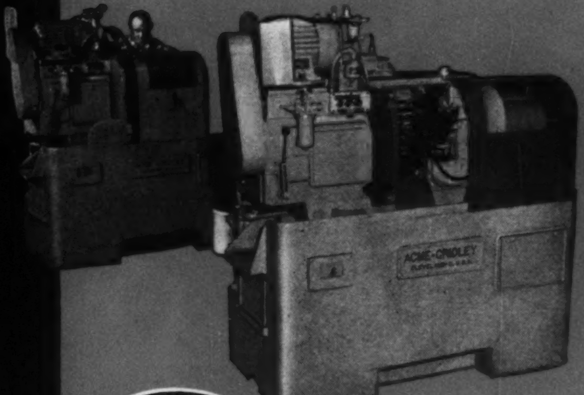


5th Position: Pick-up and cut-off – chamfer front end of next piece – back drill – eject – chamfer front end

Total Machine Time – 5 Seconds

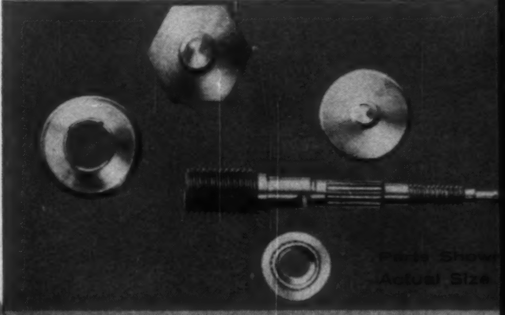
. . . also . . . cost-per-piece is substantially reduced . . . part uniformity and quality definitely improved . . . scrappage all but eliminated.

This is the *record* of two Acme-Gridley 7/16" RA-6 Spindle Bar Automatics installed at the E. F. Johnson Company, Waseca, Minnesota. Producing some 15 intricate parts, like those shown, the rugged and versatile Acme-Gridleys continually meet the rigid specs of this well-known manufacturer; help make high quality products such as the Viking Messenger Citizen's Band two-way radio available at prices that fit the public's pocketbook.

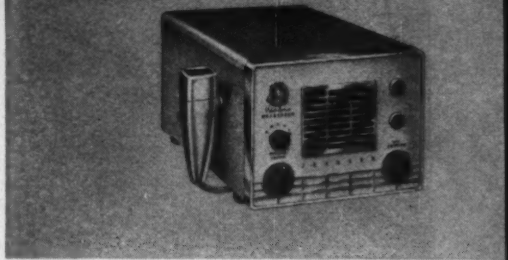


MODERN MACHINE TOOLS
MMT=PE
PRODUCTION EFFICIENCY

See this job in operation at the Machine Tool Exposition... Booth #781


Parts Show
Actual Size

Viking Messenger Citizen's Band two-way radio

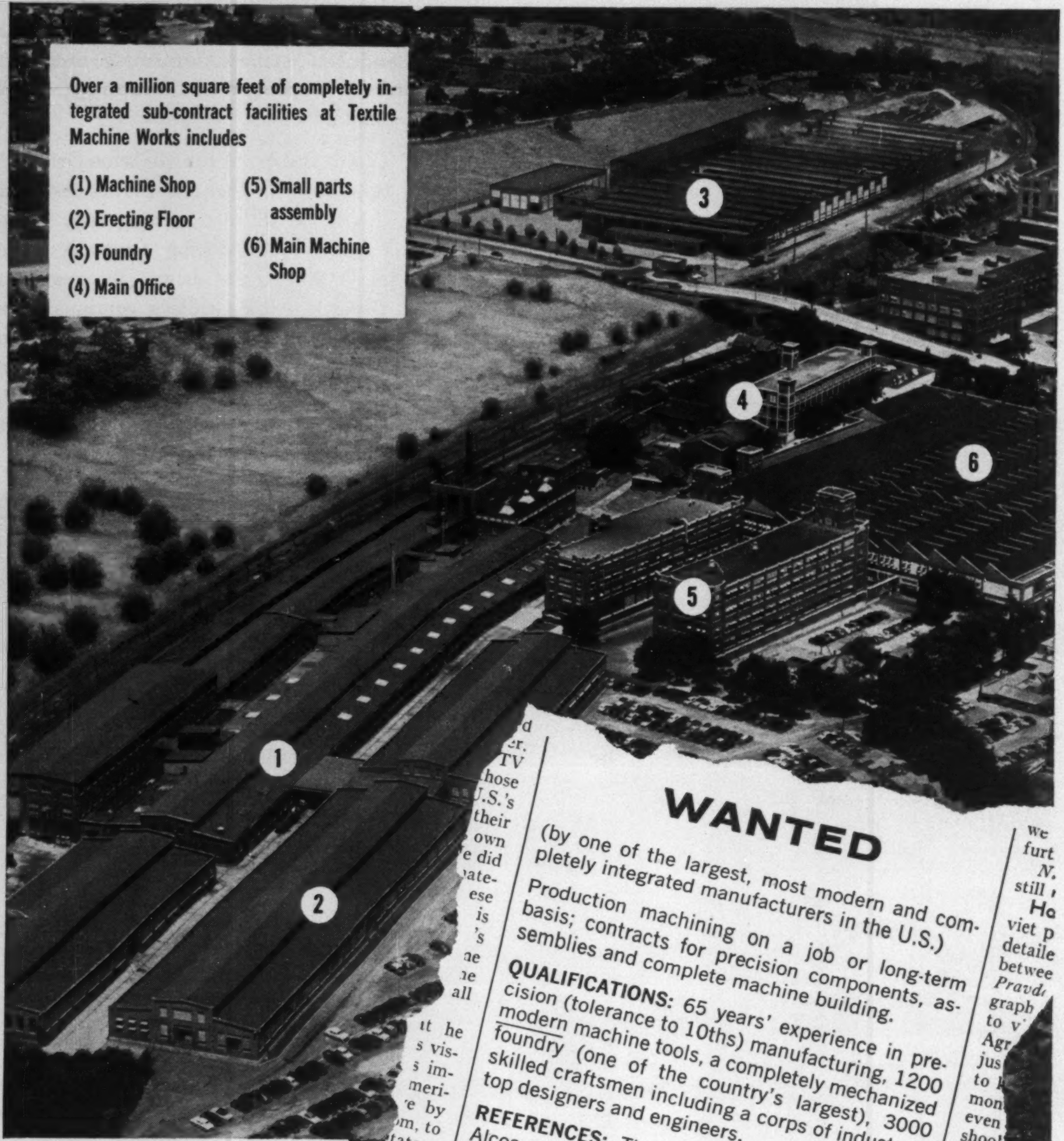


Tangible production savings, like those realized by E. F. Johnson, are assured with Acme-Gridleys. In your plant, the 7/16" RA-6, or any of the world's most complete line of multiple-spindle automatic bar and chucking machines will show you a new dimension in mass production efficiency.

National Acme

The National
Acme Company
175 E. 131st Street
Cleveland 8, Ohio

Sales Offices: Newark 2, N.J.; Chicago 6, Ill.; Detroit 27, Mich.


Over a million square feet of completely integrated sub-contract facilities at Textile Machine Works includes
(1) Machine Shop
(2) Erecting Floor
(3) Foundry
(4) Main Office
(5) Small parts assembly
(6) Main Machine Shop
1
2
3
4
5
6

WANTED

(by one of the largest, most modern and completely integrated manufacturers in the U.S.)

Production machining on a job or long-term basis; contracts for precision components, assemblies and complete machine building.

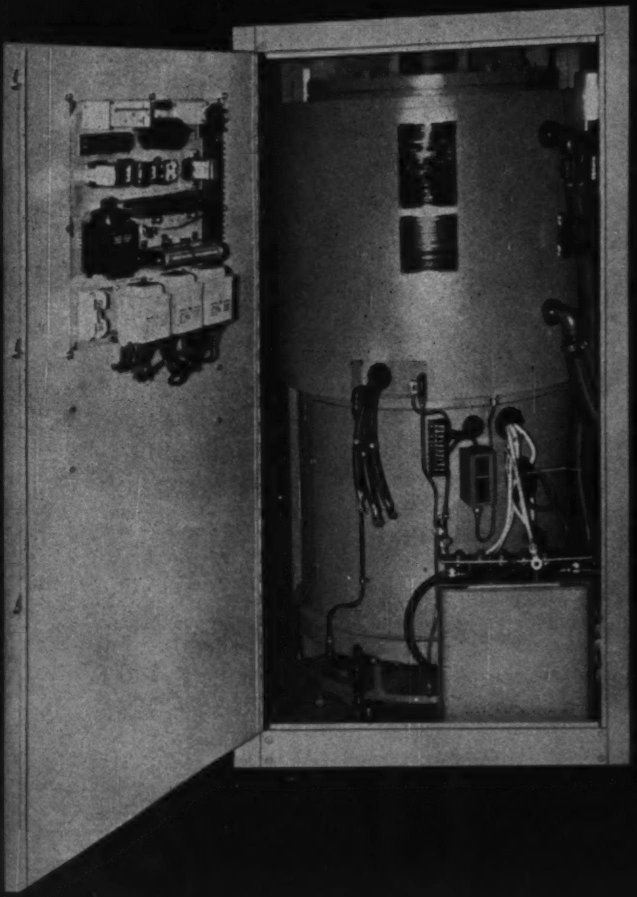
QUALIFICATIONS: 65 years' experience in precision (tolerance to 10ths) manufacturing, 1200 modern machine tools, a completely mechanized foundry (one of the country's largest), 3000 skilled craftsmen including a corps of industry's top designers and engineers.

REFERENCES: The best . . . companies like Alcoa, Du Pont, Chrysler, Eastman Kodak, Western Electric, Fairchild Aircraft, Ingersoll-Rand and others who know they can depend on TMW for quality, accuracy and on-time delivery at minimum costs.

For more details, or for new Facilities File Folder call or write today.

TEXTILE MACHINE WORKS

CONTRACT DIVISION, READING, PENNA.



- FORCED OIL LUBRICATION of the upper and lower bearings gives twice the normal expected bearing life.
- ALL AUXILIARY COMPONENTS are safely contained and mounted within the heavy gauge steel enclosure.
- EASY ACCESS for servicing or inspection without disassembly of cabinet or shroud.
- SINGLE OVERSIZED AREA water to air heat exchanger provides cooling.
- SPECIAL ROTOR LOCKING DEVICE prevents brinelling of bearings during shipment.
- FULL COMPLEMENT OF PROTECTIVE DEVICES including an annunciator panel.

The AM Motor Generator Unit is a proven Vertical Design with new features to improve service life and maintenance.

MAGNETHERMIC
AJAX ELECTROTHERMIC
AJAX ENGINEERING
AJAX MAGNETHERMIC

WATCH AM

FOR THE NEW IDEAS IN THE HEATING AND MELTING OF METALS BY INDUCTION

HIGH FREQUENCY MOTOR GENERATOR SETS

Another of the many products of AM for the heating and melting of metals by induction.

"induction heating is our only business"

Ajax Magnethermic
CORPORATION

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TRENTON DIVISION
930 Lower Ferry Road
Trenton 5, New Jersey

YOUNGSTOWN DIVISION
3990 Simon Road
Youngstown 1, Ohio

AJAX MAGNETHERMIC, CANADA, LTD.
BOX 779
Ajax, Ontario

SERIOUSLY SPEAKING...

Ask us about a delivery date on your next order !

Seaway Steel Corporation is literally "tailor-made" for the customer who requires:

FLEXIBILITY... Bars and Rods, any size or shape produced to your specifications, **regardless of quantity.**

QUALITY... Forging and Cold Heading quality. The industry's most rigid inspection.

SERVICE... Special attention to small orders. Seriously speaking, your order makes YOU boss at Seaway.

☎ LUDLOW 9700

SEAWAY STEEL CORPORATION

101 EAST AVENUE • NORTH TONAWANDA, NEW YORK

LOOK FOR THE OXYGEN SUPPLY OF THE STEEL INDUSTRY TO DOUBLE in the next two years. Announced projects will boost oxygen generating capacity to nearly 12,000 tons. At present, the capacity available to steel mills is a little over 6000 tons.

WHOLESALERS ARE BIG CAPITAL GOODS CUSTOMERS. Merchant wholesalers spent $773 million in 1958 on new capital outlays. These expenditures were divided $287 million for new plants and plant additions, and $486 million for new equipment. Merchant wholesalers include over 12,000 firms in every wholesale line.

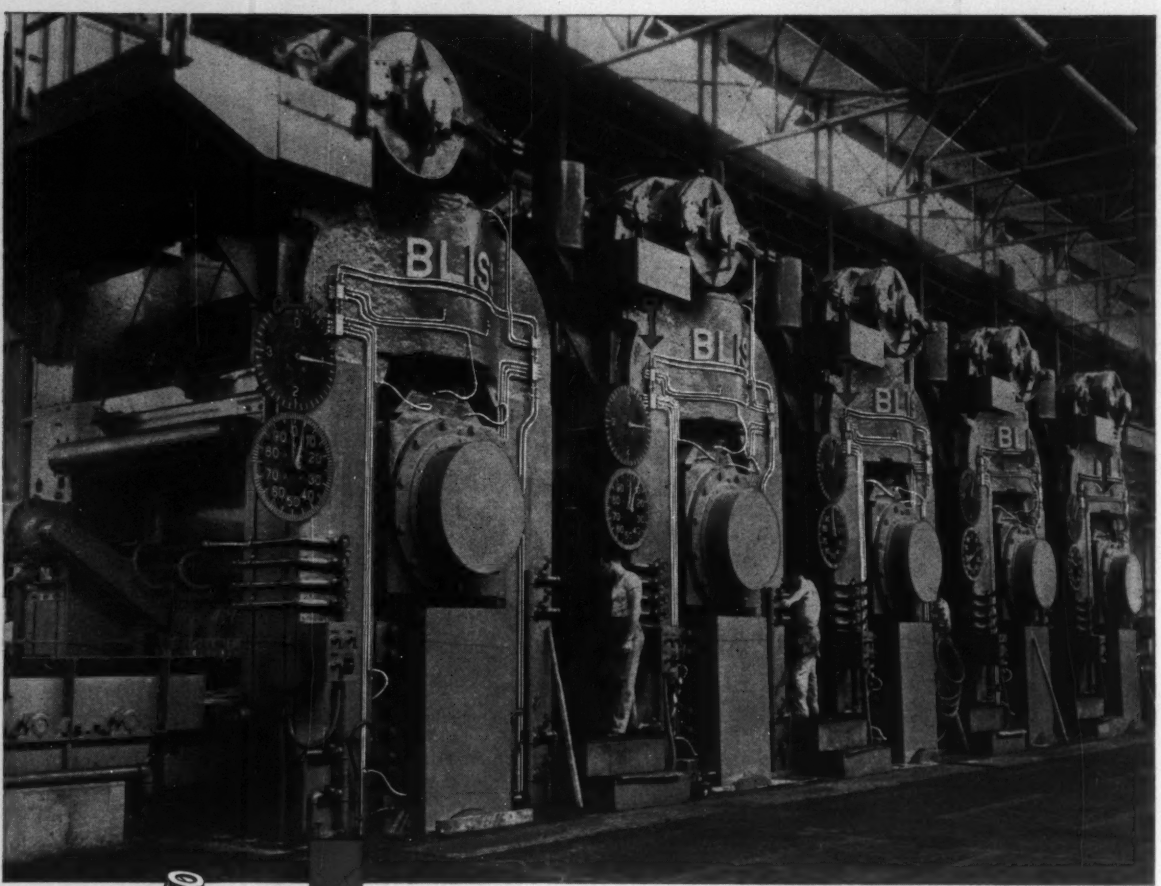
FORWARD COMMITMENTS BY PURCHASING AGENTS TIGHTEN FURTHER. This is reported by the National Association of Purchasing Agents. The association's national indexes of forward commitments for July show: Capital expenditures, stable for five months, "show no tendency" to increase; production materials and M.R.O. supplies continue downward tendencies shown for six months.

MORE COPPER, LESS STEEL is the demand pattern in the communications operating industry, according to the government. The industry, made up of telephone and telegraph companies, used about 35,650 tons of steel and 258 million pounds of copper last year. Since 1952 use of steel has decreased about 37.5 pct, while copper use has gone up 66 pct. A continued expansion of the industry is indicated by the government.

DISCOUNTS ARE OFFERED BIG ALUMINUM CAN USERS according to some purchasing agent reports. At the same time aluminum companies are pressing experiments with various alloys to provide more tensile strength to avoid the denting problem.

CORDLESS HOME APPLIANCES are reportedly taking shape on more and more designer drawing boards. Already on sale are cordless electric shavers and rechargeable portable radios. In sight are cordless electric lawn mowers, vacuum cleaners, and dictating machines. Nickel cadium batteries are what make the cordless items possible. The batteries are said to last 15 years.

THE MARKETING PROBLEM OF THE WEEK may well be the dilemma of auto dealers who are confused and uncertain as to the prices they can get for used compacts. This "first time" situation is further complicated by hefty stocks of big used cars on dealer lots.



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Prices: More Increases Coming?

Industry's Taking Another Look at Pricing Policies

After a hectic six months of price cuts and concessions, industry is reviewing price policies.

Business at any price may be replaced by business at a profit.

—By G. J. McManus.

▪ Adjusting slowly to the failure of the Sixties to soar, industry is taking a second look at prices.

The first half letdown brought an initial reaction of price weakness and even price panic. Many companies reverted automatically to a policy of business at any price.

There is still general price weakness but signs of new maturity and hardness are starting to appear. Aluminum and ferroalloy prices have moved up in recent weeks. One leading producer put through price hikes for tungsten carbides this week. Purchasing agents hear talk of increases in other lines.

Tightening Up—Behind the stiffening attitude are three developments:

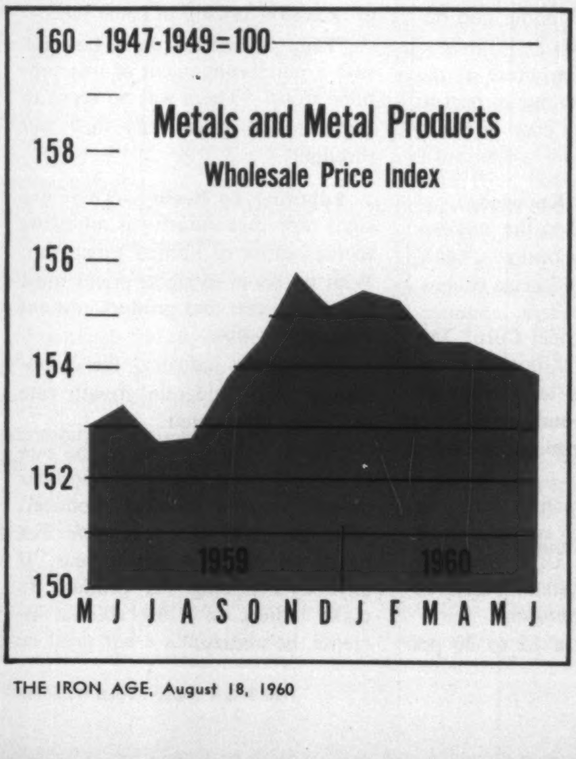
1. Rising costs are squeezing profits and exerting pressure for higher prices.
2. Companies are starting to realize there has been excessive price cutting in recent months.
3. Industry is facing up to the fact that price policies may have to be adopted to a protracted period of limited prosperity, moderate growth and intense competition.

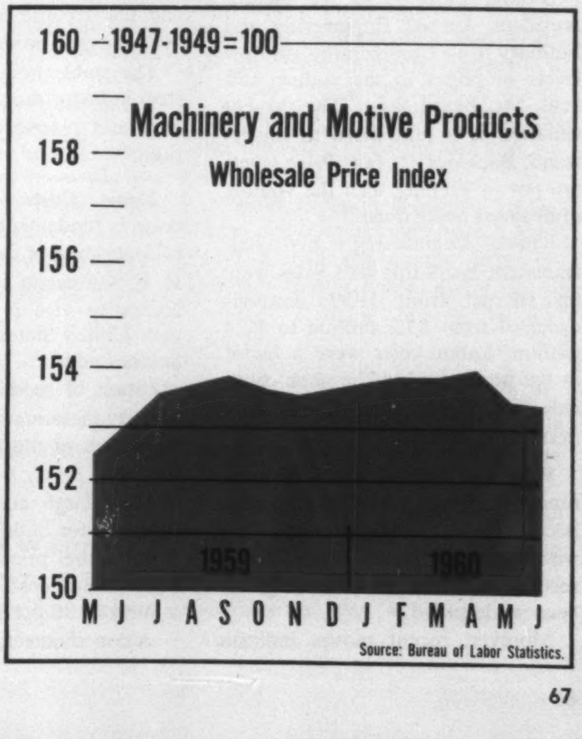
The pressure of costs shows up in aluminum's price moves. Last month Aluminum Co. of America raised prices of its recently introduced building sheets. On Aug. 1, Alcoa hiked its general line of mill products by 0.5¢ a pound. In both cases Kaiser Aluminum & Chemical Corp. and Reynolds Metals Co. quickly followed on the higher prices.

Not Surprising—It was not surprising that someone should initiate aluminum price increases. At the time of its general hike, Alcoa pointed out its labor benefits were going up 11¢ an hour Aug. 1.

A look at aluminum earnings explains why higher prices received

Metalworking Prices Trend Downward


Metals and Metal Products
Wholesale Price Index


Machinery and Motive Products
Wholesale Price Index

Source: Bureau of Labor Statistics.

"Prices should be the result of a well conceived policy—not an accident of the market place."—T. H. Cable, Koppers Co., Inc.

quick support. Alcoa's profits dropped by 25 pct from the first quarter to the second. Indicating the extent of the cost-price squeeze, Alcoa's first half sales were up by $20 million from the same 1959 period. Earnings were down $8 million.

A similar profit pinch is being felt throughout industry. In the tabulation by First National City Bank of New York, second quarter earnings showed a drop of 5 pct from the first quarter and 14 pct from the second quarter of 1959. Composite earnings of 21 steel companies fell 30 pct from the first half '59 to the first half of this year.

What's To Blame?—Sales slides can be directly blamed for some of the profit slash. And it would be normal to expect some price weakness with markets contracting. However, many industrialists feel these conditions do not fully explain current pricing practices.

Among these is G. G. Beard, president, United Engineering and Foundry Co. Commenting on low levels of prices in the rolling mill field, Mr. Beard says: "The present situation is a little hard to understand. Backlogs are fair. Price levels are not in keeping with the volume of business being done."

United Engineering's first half statement bears this out: Sales were up 10 pct from 1959; earnings dropped from $3.2 million to $2.4 million. Labor costs were a factor in the profit dip but the main cause was "the highly competitive situation in the industry."

Why Cut Prices? — Aluminum reports indicate a similar situation. Alcoa's dollar sales are up. The whole industry seems headed for a record year. Yet price slashing has been widespread.

Morever, recent moves indicate it is suppliers, and not buyers, who are keeping the pressure on prices. Alcoa reports its recent price hike stirred little unfavorable comment among customers.

Why, then, are prices being cut?

"I don't think it's a question of supply and demand," says J. M. Straub, president, Fort Pitt Bridge Works, Pittsburgh. A leading structural fabricator, Mr. Straub blames pricing problems on faulty arithmetic. "It's the failure of fabricators to recognize increases in actual total costs."

Price Policy—Variations of this theme are plugged by Koppers Co., Inc., and many others.

"Prices should be the result of a well conceived policy—not an accident of the market place," says T. H. Cable, assistant to the vice president, marketing, at Koppers. "Prices must recover the cost of manufacture, distribution, plant replacement, upgrading of technology and the expense of finding and developing new products."

The stable price structure of the steel industry may be due in part to emphasis placed on cost information.

Know Costs — "Knowledge of costs is fundamental to the successful operation of any business," said R. F. Sentner in 1957 price probes. Executive vice president, commercial, United States Steel Corp., Mr. Sentner adds: ". . . through the application of modern techniques we identify these many and varied costs with each of the products we offer for sale."

Most large companies have set formulas for building up price goals if not actual prices. U. S. Steel has its standard cost system, based on a norm of 80 pct operations.

Alcoa shoots for a 15 to 20 pct before-tax return on investment with 70 pct operations as the norm.

Maintaining Integrity — Pricing mechanics vary widely from industry to industry and are one source of confusion and weakness. In aluminum and other industries, much of the price cutting is done on a spot basis; a competitor's price is met for a particular order but there is no change in published prices.

The steel industry, on the other hand, has been able to maintain the integrity of published prices.

". . . we have a one-price policy," says Mr. Sentner. "When a change is made in our fob mill prices, the new price applies to all our customers. . . ."

Ride the Booms—Some of the price problems may disappear as industry gets its bearings in the present market situation. Over the past 15 years price thinking for many companies has been geared to conditions of rapid growth and strong demand. In the brief recession periods, prices could be cut with some assurance that the next boom would restore margins and bring increased volume.

With this background, the disappointing first half brought waves of recession pricing in some lines.

"They pushed the panic button," says a purchasing agent of one supplier group. "There was no sense to the kind of price cuts they put through."

Adjusting To Reality—There are signs now that industry is adjusting to the reality of limited prosperity. With no boom in sight, prices must be set at levels that produce reasonable profits now.

Throughout industry, the implications of a moderate growth rate are being considered.

"We've been growing at the rate of about 8 pct a year in the postwar period," says a stainless producer. "For the next five years, we can figure on about 4 pct a year. If anybody's pricing his product to make money on a big volume increase, he's crazy."

What's Next for Moa Bay Plant?

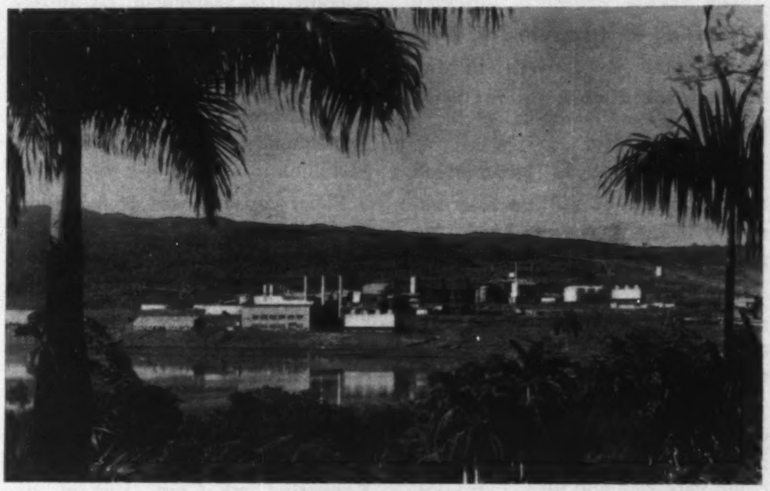
Seizure by Castro Latest Move Against U. S. Interests

Freeport Nickel faces difficult problems following seizure of Cuban facility.

Now, Castro and Freeport each have only half of an integrated operation.

- When the Cuban government created a National Mining Institute a week or so ago, the fate of Freeport Nickel Co.'s Moa Bay facility was just about sealed.

Seizure by the Castro government of the $75 million operation ended months of waiting for the inevitable.



UNCERTAIN FUTURE: Freeport Nickel's Moa Bay project is now in Castro's hands. It leaves Freeport with only half of a refining operation.

What's Next?—Moa Bay had discontinued operations last March when the Castro government passed a new mining law which imposed severe restrictions and a heavy export tax on minerals.

Terms of the seizure were uncertain early this week. One report indicated it could mean anything from outward seizure to only token control.

Half a Loaf—In any case, it leaves Freeport and Cuba each with only half a loaf.

Unlike many other U. S. operations in Cuba, the company does not turn out a finished product. It has a nickel-cobalt refinery in Louisiana. Only concentrate, in the form of slurry, comes from Cuba.

Freeport's $119 million Louisiana smelter now faces an uncertain future. And it involves four steel companies, two automakers, and the investment of nine banks, which invested a total of $100 million in the project.

The Alterative—If the Moa Bay operation is completely lost, Freeport faces these alternatives:

Disposing of the Louisiana operation, probably at a heavy loss; or going through the long, drawn-out process of financing and developing another concentrator to replace Moa Bay.

Before Freeport settled on Cuba, it made extensive surveys in Haiti, the Phillipines and Puerto Rico. However, a spokesman has discouraged reference to the Phillipines.

Profitable Ore — Reports from Puerto Rico indicate there are ore bodies which could be mined profitably. Total reserves depend on the cut-off point and how high grade the ore must be to bring profit.

Freeport's Cuban ore runs 1.3 pct nickel average and .13 pct cobalt. A 1959 report from Puerto Rico says the average nickel-cobalt ore is .88 pct nickel and .09 pct cobalt. Both ores have high iron contents.

Reserves admitted by Freeport in Cuba are well in excess of 50 million tons. The Puerto Rican report puts reserves at 90.5 million tons at seven sites. One of these sites has 46.8 million tons and another has 25 million tons.

1958 Report — An interesting sidelight is a report written in January, 1958 listing nickel-cobalt ore reserves in Puerto Rico at 40 million tons on three sites. The writer of this report predicts, "There is a 50 pct probability that a major mining and refining operation will be initiated . . . during the next six years."

While Freeport is hoping for the best, a spokesman admits that Russian - Cuban discussions have revealed that Cuba's nickel is a source of some interest to the USSR.

Will Fight — Company officials said they will take all possible steps to protect legal rights to the Moa Bay facility.

Robert C. Hills, Freeport president, said the company had been negotiating, but was faced with the demand to pay a 25 pct gross value tax.

Wood: Big Metalworking Ally

Metal and Forest Products Can Grow Together

The forest products industry is growing at a rapid rate. With this comes a growth in the needed metalworking facilities serving it.

Paper products production may increase 15 million tons annually in the next ten years.—By K. W. Bennett

▪ Forest product industries could turn out to be an ace-in-the-hole for metalworkers.

The growing timber market, increasing activity by paper processing industries, and expanded research could very well add up to extra dollars in the metalworking pocket. Already it is proving to be an excellent market. And prospects for the future are even better.

Forest products—chiefly lumber, plywood and paper—gross $20 billion annually. Timber alone is worth $1 billion.

Paper capacity was 16.8 million tons last year. By 1962 it should hit 18 million tons. Paperboard capacity hit 10.1 million tons in 1959, and will probably be at 12 million tons in two years.

Buy Equipment — All of this means more business for metalworkers. Papermakers buy equipment in the chemical or oil refining category. Kimberly-Clark Corp., one of the biggest of U. S. papermakers, averaged $25 million per year capital spending since 1955. This year it will boost capital outlays to $40 million. At the end of the past fiscal year, Kimberly-Clark reported a record $400 million gross.

Chairman of the Board John R. Kimberly tells The IRON AGE, "By 1970 it is reasonable to expect industry production of more than 50 million tons of paper and paperboard per year. That's compared with a record 34.1 million tons in 1959 and 36 million tons expected this year."

Papermakers indicate they have a two-fold need for capital input. The export market is small, but growing rapidly. In fact, it's up 125 pct from 1950. But paper mills must make cheaper papers to expand this market. To reduce cost, they must install new machines.

FOREST FULL OF METAL: The nation's forest and wood-product industries require millions of dollars worth of machinery and equipment like this power shovel used by B. C. Forest Products. (Scott Paper Co. photo.)

Growing Domestic Market—The industry also needs more capacity to handle a growing domestic market. Either drive calls for greater capital input.

The big paper processing industry is equally active. Board chairman David Weil, Cromwell Paper Co., notes that his company will expand its facilities this year.

And other companies are also planning expansions. Paterson Parchment Paper Co., Bristol, Pa., has announced a $500,000 expansion. Eastman Kodak Co. is spending $33 million for new equipment. St. Regis Paper Co., Tacoma, Wash., will spend $30 million.

A Lumber Comeback — Paper and paperboard output was 24.3 million tons in 1950. In 1958 it hit 30.8 million tons. The forecast for this year calls for 36 million tons. Plywood has shown equivalent gains. Lumber, which has dropped in billions of board feet since 1950, may be coming back.

And, on top of this increase in

the plants, there will be more metalworking needs in the "field." Gains in wood products output must also be matched at the forest level. Westinghouse-LeTourneau Co., Caterpillar Tractor Co. and Clark Equipment Co. have all been active with roadbuilding and logging machines.

One marketing director points out, "Loggers already build more road miles per year than state governments."

It is also worth note that the Pacific Northwest may no longer be the main timber producer. Florida was the top U. S. pulpwood producer last year. And the Southeast is the fastest growing timber area. More than 300 million trees were planted by private U. S. companies last year.

Small Loggers—About half the wood delivered to factories is cut by small loggers with $20,000 to $30,000 capital equipment. The small size of these logging companies has obscured the importance of this market. Often second-hand equipment has been used. As logging volume rises, newer and more productive equipment must be bought.

Surveys and studies have been made attempting to project forest requirements to the year 2000. Preliminary figures indicate 237 new paper mills will be required and forest output must double. Unlike most long-range forecasts, these figures have proven too conservative on the results thus far.

Research is also playing a vital role in this industry. Dr. E. G. Locke, director of the U. S. Forest Products Research Laboratory at Madison, Wis., told The IRON AGE, "Our lab will double in size in the next decade."

Increased Outlays—The lab has already increased its research outlays for 1961 by $300,000. This is above the $2 million to be spent this year. It will also do $1 million research this year for the Armed Services.

Dr. Locke notes, "What you're seeing is a revolution in the timber and wood products industries."

Oxygen Steel For National

A two-furnace basic oxygen steelmaking shop is due for construction at the Detroit plant of Great Lakes Steel Corp. Great Lakes is a subsidiary of National Steel Corp.

The new shop is designed to increase the total active steelmaking capacity of Great Lakes Steel to 4.2 million tons annually. Presently the annual capacity is 3.7 million tons.

National Steel is also undertaking a $300 million expansion program which has been in progress since early 1959 at three major plant locations.

The total program includes the construction of a finishing plant at Midwest Steel Corp. in the Chicago area; the installation of an 80-in. hot strip mill at Great Lakes Steel; and additions and improvements to facilities at the Weirton Steel Div.

The midwest plant will produce tin plate, continuous galvanized steel and hot and cold-rolled sheets and strip from hot-rolled coils to be supplied by Great Lakes Steel. The plant is expected to be in full production by mid-1961.

Power To Mexico

A $20 million contract for a 225,000-kw power station near Tijuana, Mexico has been awarded to Westinghouse Electric International Co. The award was made by Mexico's Comision Federal de Electricidad.

The project is among the first of an announced $1 billion program in Mexico. The program is slated to double Mexico's total installed capacity in the next five years. It will add some 2.5 million kw to the nationwide electrical system. Several other power systems in the country are privately owned.

The first generating unit is scheduled for delivery late in 1961 or early 1962. The others will be delivered soon thereafter. The turbines and heat transfer equipment will be manufactured at the Westinghouse plant, Lester, Pa. Generators and switchgear will be built at E. Pittsburgh, Pa. Power transformers will come from Sharon, Pa.

Granite City Approves New Mill Facilities

Granite City Steel Co. is going ahead with construction of a battery of 61 coke ovens and a high-speed continuous annealing line for processing light gage steel for tinplate.

The plans are the latest moves in the company's current expansion program.

The coke oven battery will be built for Granite City by the Koppers Co., Inc. Machinery for the 375-foot-long annealing line will be supplied by the Wean Engineering Co., Inc.

Construction underway or previously scheduled by Granite City will expand its openhearth capacity from the present 1.440 million tons to 1.740 million tons by 1962.

Claymont for Sale?

Despite official silence, rumors persist that Phoenix Steel Corp. is negotiating with Colorado Fuel and Iron Co. for CF&I's Claymont plant, at Claymont, Del.

The Claymont plant's main facilities include seven openhearths, a plate mill and a pipe mill.

Cooperate to Compete

Over 400 U. S. companies have organized 35 export trade associations. These associations account for close to $1 billion or 6.2 pct of all U. S. domestic merchandise exports annually. This is reported by the Federal Trade Commission.

The law sanctioning these associations (The Webb-Pomerane Law, or Export Trade Act, 1918) exempts these associations from most of the restraints of the Sherman Anti-Trust Act.

These associations export a variety of products, including machine tools, ores, metal products, abrasives, and typewriters.

But, like many export aids, foreign trade authorities believe U. S. business does not take advantage of the law.

How to Get Started in W. Europe

By **D. A. Scott,** Vice President, The Chase Manhattan Bank, New York

Despite the lure of a growing market and the promise of lower costs, there's a lot more to manufacturing abroad.

Not the least is a long, hard look at present product strengths and management capabilities.

▪ The expanding economy of Western Europe has caused American business men to look upon the area both as a fertile field for market development and as a growing source of competition for domestic and world markets.

Since World War II, many billions of dollars have gone into rebuilding Western Europe's industrial capacity. Much of this was made possible with American aid. But a lot also has been accomplished through private investment and the efforts of European countries themselves. Today, Western Europe can point to a robust, efficient industrial plant.

New Pattern—Along with European industrial growth has come a changing pattern of consumer demands. As living standards rise and traditional ways of doing things are put aside, more consumers are becoming interested in the products of a mass-production economy.

The six European Common Market countries, with a total population close to that of the United States, are rapidly taking on the aspect of a single mass-market area. Trade barriers among the six countries are coming down. Plans are being made for integrating their economies and they will soon take the first step in the direction of a uniform tariff toward the rest of the world. More recently the Outer Seven countries led by Great Britain have taken steps to reduce the barriers to trade among themselves.

Feel Impact—It is against this broad background that many American business men are feeling the impact of Western Europe's thriving economy. The big question for their particular companies is what should be done to compete with it or capitalize on it.

As a banker, frequently I have the opportunity to discuss not only financial matters but also the broader aspects of business activities with a wide range of companies.

Among these are companies which are already involved in overseas operations; others which are not, but are feeling the effects of foreign competition; and still others not participating abroad, nor being hurt by foreign-made goods, but which could add to their long-term profit picture by going into business overseas.

"Do's and Dont's"—After taking part in these discussions for many years, certain "do's and dont's" on whether or not to enter foreign markets begin to appear.

Some companies, for example, have seen product lines priced out of U. S. markets by foreign goods. But does this mean the only answer is to manufacture abroad? Not always, by any means.

The first step in facing up to foreign competition at home is to know what it is and why it is. Checking how deeply foreign-made products have penetrated the mar-

Common Market's Export Challenge

Exports from the Common Market, $ Millions, F.O.B.

	To Rest of World			To Other ECM Nations		
	1958	1959	Pct Gain	1958	1959	Pct Gain
Belgium—Luxembourg	$3,048	$3,288	8 Pct	$1,380	$1,500	9 Pct
France*	3,200	3,843	20	1,140	1,510	33
W. Germany	8,808	9,802	11	2,412	2,700	12
Italy	2,532	2,870	13	612	780	27
Holland	3,216	3,698	12	1,332	1,570	18
ECM Total	$20,804	$23,411	12.5 Pct	$6,876	$8,060	17 Pct

*Not including exports to franc zone. Source: O.E.E.C.

ket and then finding out the reasons for their success, makes more sense than a quick decision to drop the line or pull up stakes and manufacture in Western Europe.

Long-Term View — It could be that despite lower manufacturing costs aboard, the long-term profit outlook for the products may not be promising enough to make an additional overseas investment pay off.

Or, perhaps a thorough examination of the invading item may point out the need for a product redesign which can once more restore the product to its competitive position without the need to manufacture it overseas.

Ground Floor—Other companies look to Western Europe and see the possibility of getting in on the ground floor of an expanding market, taking advantage of lower labor costs and taxes, enjoying the benefits of lower tariffs within the walls of the Common Market and the Outer Seven, and decide manufacturing overseas is for them. But is it?

Whether for reasons of more profit opportunities abroad or competition at home, the company pondering a venture overseas must first take a good look at itself.

Does the company have a merchandisable product for overseas consumption? The answer to this prime question depends on a lot of others. Is the styling and design of the product up to date, or has it been getting by in this country because of earlier years of consumer acceptance and loyalty?

Check Methods—Also, how high a labor content does the product have? Will savings on labor costs be enough to justify an overseas investment? Further, have manufacturing methods been kept up to date in this country so that the company has something to gain from applying its processing know-how overseas? And what advantages do the company's patents offer in competing against foreign products?

These are but a few of the questions a company must find the answers to in taking an inventory of its capabilities for going into business profitably abroad.

MARKETING VIEW: As international staff marketing officer, Chase Manhattan's David A. Scott presents pros and cons of competing abroad.

Still others include the amount of capital a company has on hand to invest overseas and the effect this capital drain will have on long-term company operations.

Then there are questions of how effectively present sales and distribution methods, particularly for mass-produced items, can be applied in Western Europe. Is the market big enough to absorb certain mass-produced items? Or does product appeal lie in technological superiority?

Management Fitness — Before a decision is made whether or not to enter the Western European market, the most vital area for a company to look into is the management itself.

How much does the management know about foreign markets and operations? Even more important, does it have the ability to adjust to changing sales, labor and manufacturing conditions? How might top management people react to a joint venture with foreign nationals? Does, or can, the company management think of itself as part of a world marketing picture or not?

Only after all these questions, and many more, have been answered should a company decide whether or not to go into business abroad. If most of the answers are on the plus side, the next step calls for a very intensive study of the manufacturing, marketing, financial, and political aspects of the various regions in Western Europe.

Survey Market — Within these broader areas lie many subjects which must be carefully investigated. In determining manufacturing costs, for example, a company must look into: raw materials costs and supply; the availability and costs of foreign managers and skilled workers; water and power supplies; and shipping charges.

In the marketing area the company must find out the degree of competition already existing in Europe for its products; how competing companies are grouped as far as tie-in arrangements and inter-company agreements are concerned; the incomes of various regions and the ability of potential customers in these areas to buy its products.

The financial aspects of the operation, too, must be thoroughly investigated. The availability of long-term financing at home or abroad, and local financing for short-term needs should be checked.

(Continued on p. 74)

Political Questions — Finally, a company planning to enter the Common Market or Outer Seven areas must look into the political consequences of the treaties which bind these trading groups together.

It must also consider the political nature of the country in which it hopes to locate, its philosophy regarding business and the concessions it is willing to make to attract industry.

Finding the answers to these questions, so important to management in making a decision to enter overseas markets, can be a difficult and time-consuming proposition.

Companies that do not already have extensive experience in European operations often find that making use of a reliable management consultant, market research firm, or plant location service proves to be a wise investment. And even firms with extensive overseas experience are well advised to check thoroughly with legal experts on the tax and legal complications of the situation before deciding how to enter the European market.

How Bankers Help — Having been close to many situations of this kind, bankers also are often in a good position to render assistance to companies planning to invest overseas.

Through world-wide banking connections they can put them in touch with local government officials, arrange local financing facilities, and, because of stepped up research in recent years, can often make available preliminary economic surveys of various marketing areas in Western Europe.

These same world-wide connections permit bankers to offer another important service—introducing the American company to foreign firms that may be willing to join in an enterprise overseas. Many U. S. companies have found that such local partners provide valuable knowledge of business methods and markets abroad.

Two-Way Street—By no means is American capital investment in Western Europe a one-way street. Europeans, many of them, are actively seeking an American partner not only to improve their competitive position in Europe but to obtain sound, established sales outlets in the United States.

Once it has been decided that Western Europe is a fertile ground for additional investment, then a company must decide which one of the methods of entering the market will be the most suitable.

U. S. BUSINESS AND WEST EUROPE

This is the last of a four-part series on the impact of W. Europe on American industry.

Others in the series include: What the European Common Market Means to U. S. Business, July 28; U. S. Plants Are on the Rise in W. Europe, Aug. 4; and Wages and Taxes in W. Europe, Aug. 11.

This choice depends on the nature of the company's products and its financial position.

Generally there are about four ways a company can enter the Western European market. These include: 1. Direct selling from the United States by American or foreign-born sales representatives; 2. Overseas branch sales and engineering offices; 3. Licensing agreements and; 4. Complete or partial ownership of overseas facilities.

Exporting Problems — For the most part, exporting from the U. S. is becoming a less desirable method of tapping the European market. As "outsiders," Americans will find that tariff barriers will work against the most competitive pricing.

However, if a company's products have certain technological advantages over European goods, if the tariffs on these items are low, or if the long-range outlook for their continued sale is uncertain, exporting is probably the least costly and most advantageous route to follow.

For pretty much the same reasons, licensing agreements can be made the basis for entering Western Europe's markets.

The investment required is low, and less management manpower is required. The licensee does not face the same tariff barriers as a U. S. exporter. In addition, through cross-licensing, American manufacturers can add to their product line by taking on established foreign products of foreign manufacture. Another reason for licensing is the inability to find a foreign partner.

Ownership — Again, if a heavy foreign investment is out of the question, a branch sales and engineering office in Western Europe may be the first step to a foreign manufacturing operation.

Foreign branch sales and engineering offices permit the testing of foreign markets and allow time to thoroughly investigate the feasibility of an overseas facility without too much risk. And if service and engineering are major factors in marketing, branch offices are often the best bet, short of an actual capital investment, for successful selling in Western Europe.

If the long-term outlook for a company's products is favorable, then the best approach to marketing in Western Europe is through the ownership of overseas facilities. This can be done through complete ownership or a joint venture with foreign partners in manufacturing.

Lower Tariffs—By this method American companies can assure themselves of participation in the area's growth, the advantage of lower tariffs within the trading areas, and a lower-cost base for selling in other foreign countries.

But regardless of the methods chosen, participation in Western Europe's markets should not be regarded as a royal road to profits.

The decision of whether or not to go, and the choice of where and how to go, should be taken by company management based on competent advice and careful study.

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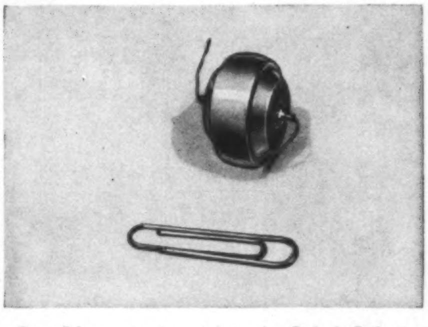
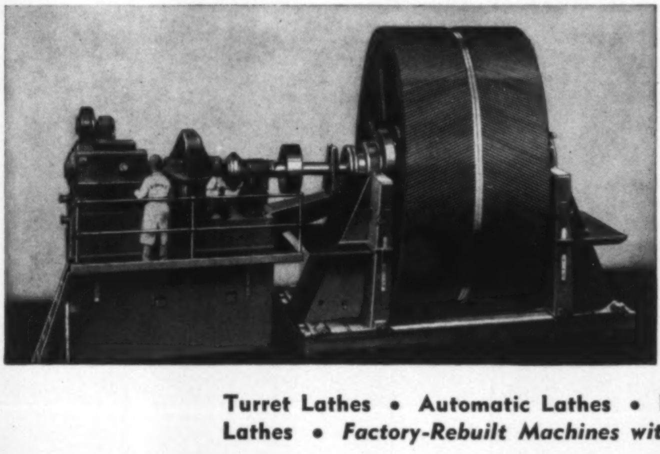
ROTATION WITHOUT VIBRATION

in rotating parts from 1/4 oz. to 100,000 lb.



Over 20 standard models in the Gisholt Balancer line handle parts ranging from the small gyro motor (shown compared to a paper clip) to the massive gear shown in a Gisholt Floor-Type U Balancer.

Accuarcy? You can measure vibration as small as .000002" on the small gyro motor using an HS Balancer, and vibration as small as .000025" with the large Type U Balancing Machines.



The Gisholt method is fast and simple . . . eliminates guesswork . . . handles single parts or large production runs at lowest cost.

Just load the work and apply rotation. Whether the part requires correction in one or two planes, the angle of unbalance is clearly indicated. The direct-reading amount meter shows how much material must be added or removed — in terms of the correction method most suitable for the work.

Gisholt Balancers are easily equipped with integral correction equipment that permits combining location of angle, measuring of unbalance, correction and inspection in one handling. For full information, call your Gisholt Representative, or write for our Balancing Catalog 1109-C.

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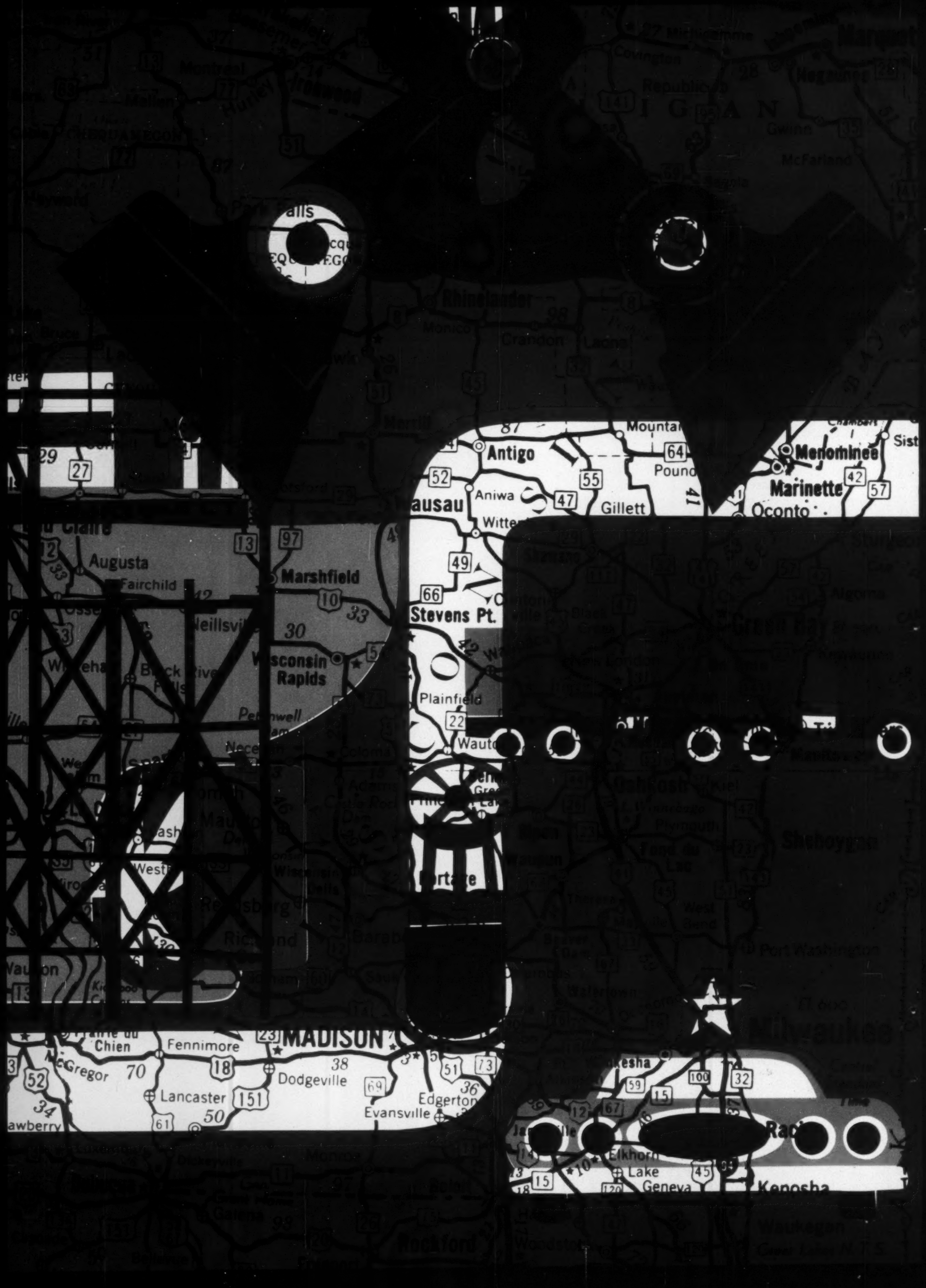

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ONE OF A SERIES DEPICTING MARKET AREAS SERVED BY INLAND • ART BY TOM KAMIFUJI

INLAND STEEL IS

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ISCONSIN
Milwaukee

Here, since Inland's earliest days in the business of making steel for industry. And as this phenomenally productive area grew in stature and might, so too did Inland—learning at first hand the limitless needs of Wisconsin's creative men. For out of this electrifying atmosphere has come a bewildering array of products . . . 20-stories-high power shovels, enormous earthmoving equipment, materials handling equipment, giant overhead cranes, drilling pipe, transmission pipe—the "Big Inch" for the nation's oil and gas industry—millions of cans for the brewers of beer and the state's great vegetable pack, mining, dairy and road-making equipment . . . turbines, electric and diesel engines . . . automotive frames, mufflers and ignition systems. Here, too, is the home of the biggest single auto-assembly plant in the nation.

From Wisconsin comes wonderful cheese and dairy products, more canned peas than from any other state in the Union, cherries, cranberries and the products of our country's greatest paper mills. Here, is Taliesin-East, Frank Lloyd Wright's famous workshop for architects . . . the white frame house where in 1854 the Republican Party was born . . . the shipbuilding towns along the shores of Lake Michigan . . . millions of acres of game-filled forests, thousands of crystal clear lakes and the best muskellunge fishing in the north. And here, is Milwaukee . . . with its famous "Braves," its great harbor, its sauerbraten, its bratwurst and its . . . Gemütlichkeit.

Here, in Milwaukee, Inland Steel established its first District Office. Here, Inland is not only a supplier of steel, but an intimate part of the whole—buyer of machines and equipment for its mills—mining its limestone at Manestique, iron ore at Ishpeming, Iron River and Crystal Falls in Upper Michigan—building its ore carriers like the giant "Edward L. Ryerson" at Manitowoc.

Today Wisconsin manufacturers look to Inland for sound metallurgical advice, depend upon Inland for prompt steel delivery, know the company's long record of quality and service. *As it has been in the past, Inland is here . . . and here it will be in all of Wisconsin's great tomorrows.*

INLAND STEEL COMPANY
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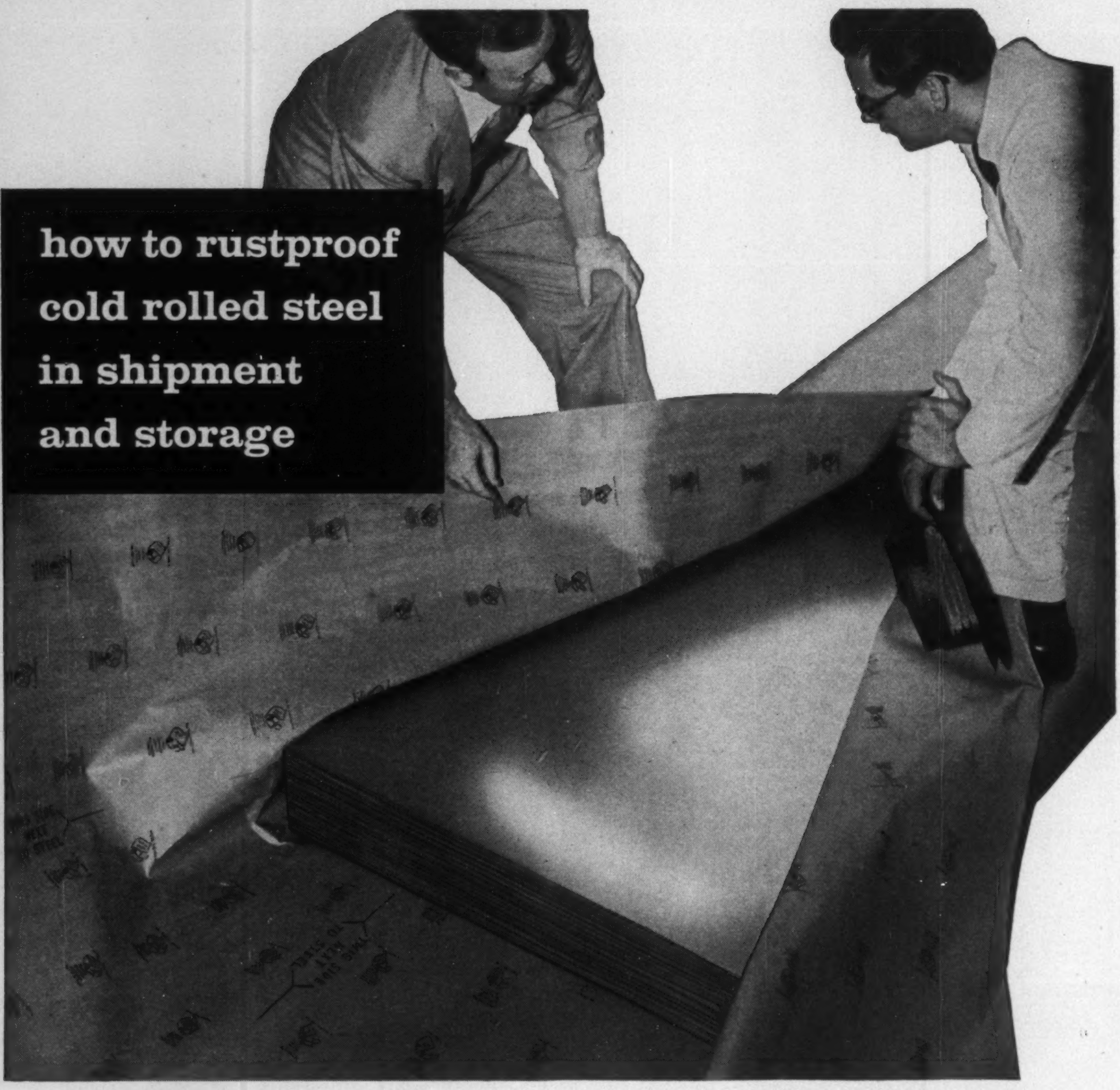
INLAND®

66 years of service to the Industrial Middle West

how to rustproof cold rolled steel in shipment and storage



Proved by actual test! Unwrapped steel rusted within a few hours. Identical steel wrapped in Ferro-Pak showed no signs of rust . . . even after several months. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 180 N. Wabash Ave., Chicago 1, Ill. Dept. A8

How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.

How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

FERRO-PAK®

by Cromwell

For over 38 years—
"Paper Engineers" for Steel

Are Business Schools Lagging?

How well business will be run depends, in some degree, on the caliber of business school graduates.

Yet studies show many schools are stressing quantity rather than quality.

▪ Business will suffer if the quality of business education doesn't improve.

That's the conclusion in study after study on business education. One point hammered home is this: Quality, not quantity, of business school graduates must be stressed.

"The crying need in business is for more graduates of above average ability . . . not for more and more mediocre graduates with watered down . . . degrees," says Prof. James E. Howell of Stanford University, writing in the Univ. of Michigan Business Review.

Screening Needed — The "open door" admissions policies in many schools, he says, have prevented a rise in entrance and achievement standards comparable to other professions. "Colleges concerned with quality should keep the lid on undergraduate enrollment in business administration."

Some of his predictions:

"In the coming decade, better faculties will try to hold the line on undergraduate teaching to protect other activities. Some will probably concentrate their scarce energies on training at the master's level." (Right now, he notes, one out of five bachelor's degrees in the U. S. goes to business administration students. But fewer doctorates are awarded in business.

What's Wanted—Critical examination of business education has been going on for some time. Last year a Ford Foundation report listed these basic skills necessary to businessmen: Analytic ability and judgment; skill in interpersonal relations; ability to accept responsibility and make decisions; general administrative skills; breadth and flexibility of mind and imagination; skill in personal communication; strong personal motivation.

"Yet," says the report, "there are relatively few business schools that adhere consistently to these principles in the details of their educational programs."

Upgrading Urged — Both this study, and another by the Carnegie Corp., urge an upgrading in business education. They ask for more demanding courses of study. The Carnegie Corp. report urges studies which have genuine intellectual, analytical, and literary content. It calls for a de-emphasis of "narrow professionalism and vocationalism," suggesting these be handled through company training programs, evening schools, junior and community colleges, and similiar organizations.

More Economic Study Urged

▪ Probably no area of college training has been more severely criticized by businessmen than economics.

But a study by the Opinion Research Corp., Princeton, N. J., shows studying economics in college brings students closer to a strong belief in the free enterprise system. And such studies make a student more conservative—not more radical.

The survey was conducted by the ORC's Public Opinion Index for Industry among 4500 students in 12 midwestern liberal arts colleges. It indicates:

What Tests Reveal—Students develop an understanding of economic reality only when they are given substantial economics training, the ORC says. In a quiz covering such areas as the role of capital, the nature of competition, prices, wages, profits, and productivity, economics majors got the highest rating—72 pct. Business majors scored 67 pct, seniors who had economics courses, 63 pct, seniors without economics, 52 pct, and freshmen, 49 pct.

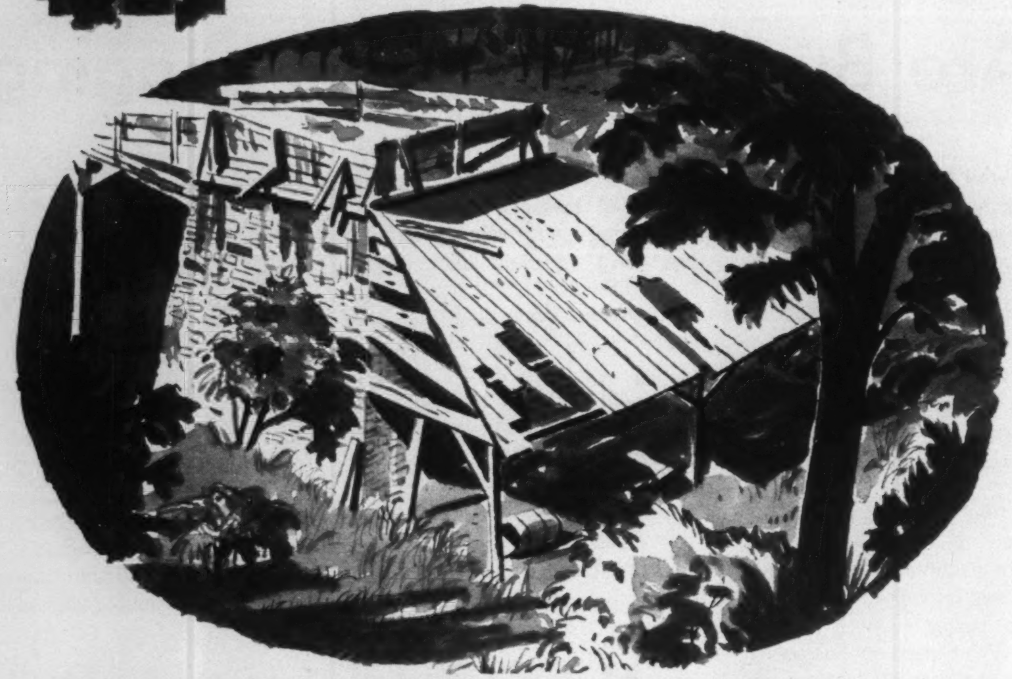
Companies can aid in spreading economic awareness the ORC says. Among the suggestions: Summer workshops to help high school teachers grasp economic fundamentals. More seminars for teachers, offering them a look at the ways industry operates.

FRB Takes Action To Ease Credit

The Federal Reserve Board is moving swiftly to ease credit. The latest move: A cut from 3½ pct to 3 pct in the discount rate—the rate charged by the FRB on loans to member banks.

Earlier the FRB lowered the cash and reserve requirements of member banks, increasing their lending power.

AMERICAN ORIGINALS IN IRON AND STEEL



22 YEARS DOWN-TIME!

There was a span of 22 years between the time the first American blast furnace was completed, until the time the first ton of iron was commercially produced.

In 1620 John Berkeley and a group of followers left England to build the first ironworks in America at Falling Creek, Virginia. As Berkeley and his crew cleared the land, erected houses and began constructing the furnace, the ever-present, suspicious Indians watched in the background.

Just as the blast furnace was to begin operation on March 22, 1622, the Indians attacked the ironworks and surrounding settlement. During the ensuing massacre, the Indians killed all but one of the 384 colonists and completely destroyed the furnace. Twenty two years passed before the first successful production of iron began, this time in Massachusetts.

It was not until many years later, after long usage of raw and calcined dolomite for fettling basic open hearth furnaces, that The J. E. Baker Company developed Magdolite, the original dead-burned dolomite. Since its inception, however, this superior product has offered producers lower refractory costs, increased furnace efficiency and more uniform ingots. The next time you buy, remember to specify Baker's Magdolite or Jebcolite. They are always 5 ways better . . . in composition, preparation, strength, economy and quality.

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Don't Write-Off the Luxury Cars

Despite New Compacts, There Are Buyers for Big Cars

In their bids to hold on to big-car buyers, automakers plan a lot of changes for 1961.

Chrysler-Imperial Div. even hopes to boost sales by 50 pct or more.—By A. E. Fleming.

- Compact cars, though they don't clash head-on with the high priced autos, are causing designers of the luxury makes to take serious note of the small car trend.

Cadillac and Lincoln, for example, will offer shorter wheelbases in October.

But there will be no scaling down by the third member of the high-priced three. Imperial isn't yielding to the compact's influence. Also, officials at Chrysler Corp.'s luxury division view the new compact entries as an advantage. They are referring especially to the entries of Oldsmobile, Buick and Pontiac.

The C-I Role—C. E. Briggs, general manager of Chrysler-Imperial Div. says, "We have no intention of introducing a compact car next year or any other year. Our role is to concentrate on full-size luxury cars of 122 in. wheelbase and up."

Actually, the wheelbase of the Cadillac and Lincoln small car entries won't measure less than 122 in. But 8 in. are being chopped from the wheelbase of some 1960 models. This is viewed by Chrysler-Imperial as nothing less than a compromise with the compacts.

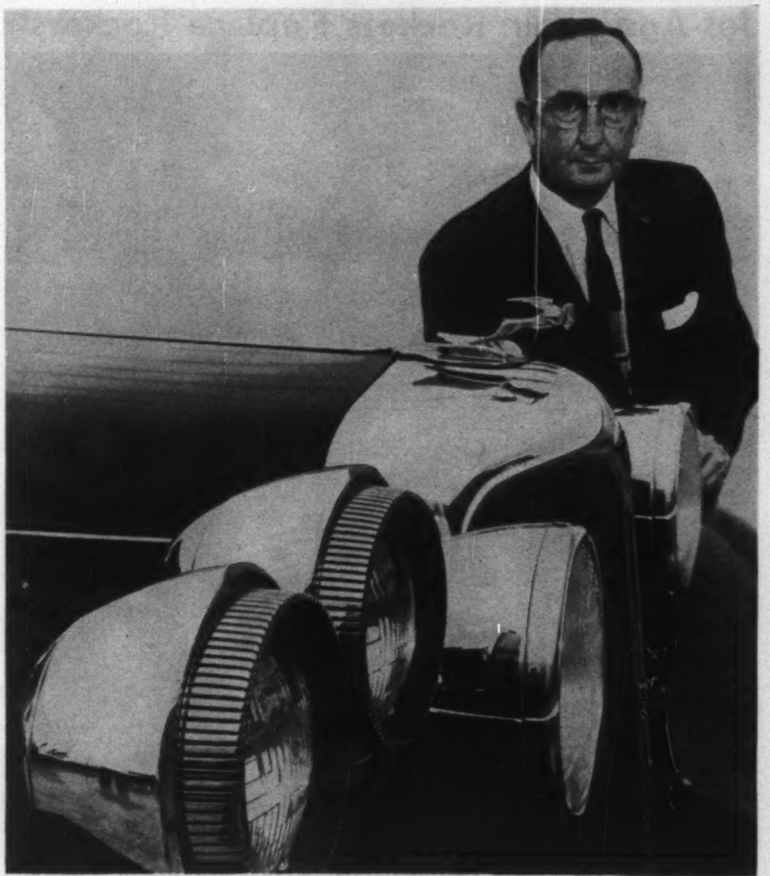
Looking Ahead—(Note: Chrysler downgraded its lowest-priced Windsor series several years ago. It had been built on a 126-in. wheelbase chassis. In 1958 Dodge started building the series for Chrysler, using the 122-in. wheelbase Dodge chassis.)

Mr. Briggs also envisions one million sales by luxury car manufacturers for the 1961 models. This vision includes 110,000 to 120,000 Chryslers and 24,000 to 26,000 Imperials. It is based on a 50 to 60 pct gain over 1960 for Chrysler and a 40 pct gain for Imperial.

Sales Are Up—Thus far in the 1960 model year, Chrysler sales are 24 pct ahead of 1959. Imperial sales are up 5 pct. The most improvement in the Chrysler line is in the top-priced New Yorker series with sales up 45 pct.

It is interesting that division management should predict such gains. Most automen today look for 1961 to be no better than 1960 for the industry as a whole.

But Mr. Briggs says "decreasing competition" is largely responsible for the predicted sales boost. He lists the Buick-Oldsmobile-Pontiac stepdown into the compact range as a factor.



THE OLD WITH THE NEW: C. E. Briggs, general manager of Chrysler-Imperial Div., compares the "free-standing" headlamps in the foreground, planned for the 1961 Imperial, with those on a 1931 Imperial.

Karting: Fun and Big Business

Already This Craze Brings In $40 Million Annually

While there are some who feel karting is a passing fancy, there are others investing heavily in it.

Kart manufacturing is mushrooming around the world. Already 300,000 karts are in use. —By R. R. Kay.

▪ Karting. Is it another hoola-hoop craze? Will it flicker out?

In just a few years, the speedy little karts have become a worldwide craze. A kart is a bodyless car with a single-cylinder engine. It's used for fun and retails at between $150 and $900. The average cost of the kart is $350.

All ages are taking up this new sport. And it all started as one man's hobby in a Los Angeles garage. Today it's a multi-million-dollar industry.

Metalworking Market — This fledgling is now running about $40 million per year. And it's opening a big new market for metalworking goods. Chassis, wheels, engines, fittings and fasteners, and kart-carrying trailers, are all necessary to production.

Metal goes into kart-racing tracks, too. Some 1800 such tracks have sprouted up all over the country. Many tracks use tons of steel for guard rails, grandstands, light towers, pits, service and accessory buildings.

Just how big is the business today? It's mushroomed so fast nobody can really tell.

300,000 Karts—So The IRON AGE called on Fred H. Jones, Jr. His job is managing kart engine sales for McCulloch Corp., Los Angeles. It's one of the large producers of kart engines in the country.

His best estimate is that 150,000 karts are running around in the U. S. And that the same number again are racing throughout the world. Mr. Jones also thinks that 200,000 of these single-cylinder engines will find a market in this country during 1960.

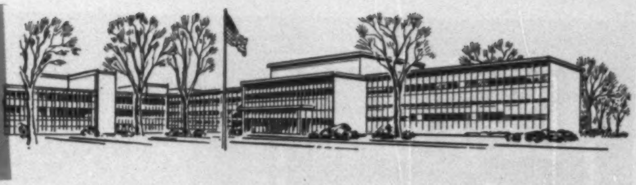
Right now there are as many as 350 firms making karts. But five or six of these are doing 50 pct of the business. Other producers turn out mufflers, pumps, and accessories.

Market's Heart — Heart of the market is in California, with nearly half the kart business. Biggest plant is Bug Engineering Co., Azusa, near Los Angeles. President Tom Pierson told The IRON AGE his firm now turns out 150 karts a day. It's the country's only plant built from the ground up just for kart-making.

Jet-Age Chair: Rockets Replace Rockers

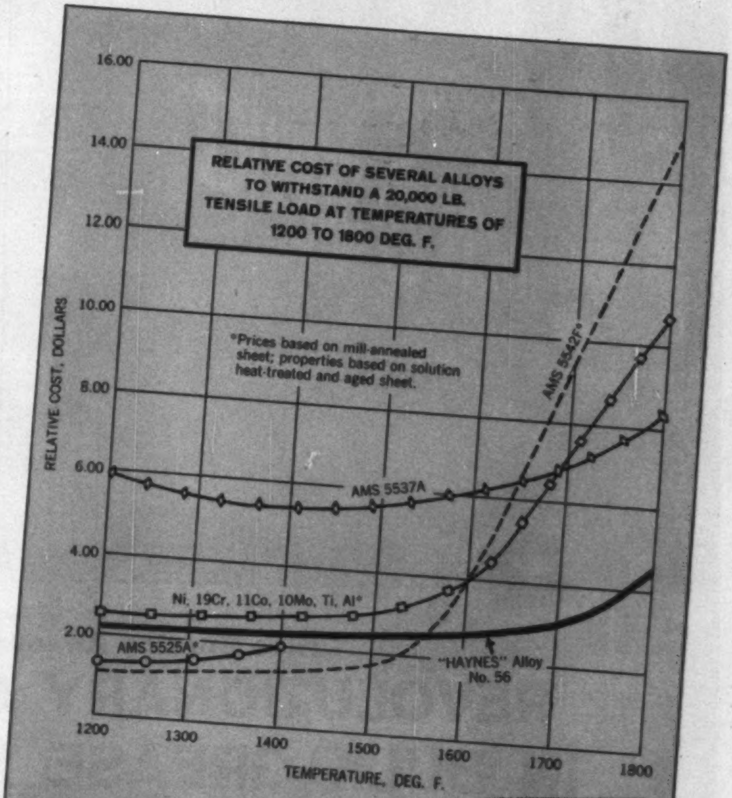
ON THE WAY UP: New rocket-powered ejection seat, designed by Convair Div., General Dynamics Corp., lets fliers bail out at speeds up to 1500 mph. It will soon be installed in the Air Force F-106 Delta Dart, an all-weather interceptor which is built by Convair.

HAYNES
ALLOYS



RESEARCH REPORTS

New High-Temperature Alloy Improves Cost-To-Strength Ratio



Excellent strength and oxidation resistance in the 1200 to 2000 deg. F. range are among the features of HAYNES Alloy No. 56—a new high-temperature alloy developed by Haynes Stellite Company.

A sampling of its cost advantages at a given tensile load, compared with other high-temperature alloys in the graph at the right, is well worth your study.

Alloy No. 56 can be readily hot-worked and formed. It is easy to heat treat. It comes in the form of sheet, plate, bar, wire, and coated welding electrodes, and can be furnished as sand-, investment-, and resin shell-mold castings. The coupon below will bring you a wealth of technical data.

The new iron-base alloy contains nickel, cobalt, chromium, and molybdenum. It has high strength at temperatures up to 1500 deg. F and maintains useful strength at temperatures as high as 2000 deg. F.

HAYNES
ALLOYS

HAYNES STELLITE COMPANY
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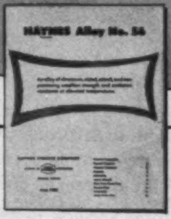

Haynes Stellite Company, Dept. 21
270 Park Avenue, New York 17, N.Y.

Please mail me the free, 16-page properties-data booklet on the new HAYNES Alloy No. 56.

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CITIES SERVICE
CITIES SERVICE

In a delivery to the U.S. Steel Gary works, the temperature of the grease was 25°F. Still, 22,860 lbs. of grease were pumped to the storage tanks in 65 minutes, with a pressure of 100 psi.

Cities Service Announces

REVOLUTIONARY CONCEPT IN BULK GREASE HANDLING

Until now the standard container for shipping and handling industrial greases has been the 400 lb. drum. For companies using large quantities of grease, these drums present such problems as: cost of storage and multiple handling—full and empty; up to 10% residuary waste; and the necessary cost of the drums themselves.

Cities Service, in cooperation with DuBois Engineering and Manufacturing Corp., recently embarked upon a program to develop a system for delivering grease in bulk from "the grease kettle to the bearing." The result is a tractor-trailer unit with two 12,000 lb. capacity containers. A gear-type pump on the truck transfers the entire load to the customer's stationary central storage containers in less than an hour. This system revolutionizes the concept of grease handling for companies using centralized systems.

The new Cities Service bulk-delivery truck is presently operating in the mid-west states with plans for expanding this service to other areas.

If you are a bulk grease user, the time and money this system can save you are well worth looking into. For the full story, call your local Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, 20 N. Wacker Drive, Chicago 6, Ill.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

Will Grinders Get More Work?

New Features, More Power Should Give Them a Boost

There's a good chance that more jobs will call for surface grinding operations.

New developments increase both output and versatility.—By R. H. Eshelman.

▪ Look for more surface grinding operations to be specified in production engineers' process sheets. That's the word from sources around machine tool centers.

Recent advances in surface grinders have made practical their application to stock removal operations. The Machine Tool Exposition at Chicago will merely focus attention on the trend—and confirm it. Meanwhile, grinder developments are boosting their traditional role as precision finishing machines.

The trend stems from rising production costs and a growing recognition of some overlooked efficiencies inherent in grinding processes.

More Muscle — Surface grinders are getting more muscle to take advantage of improved grinding wheels. Grinders, powered a few years ago with 50 hp maximum, now boast up to 125 hp a spindle. Besides structural support for this increased workload, new and significant operating features are further enhancing stock removal potentialities of the process.

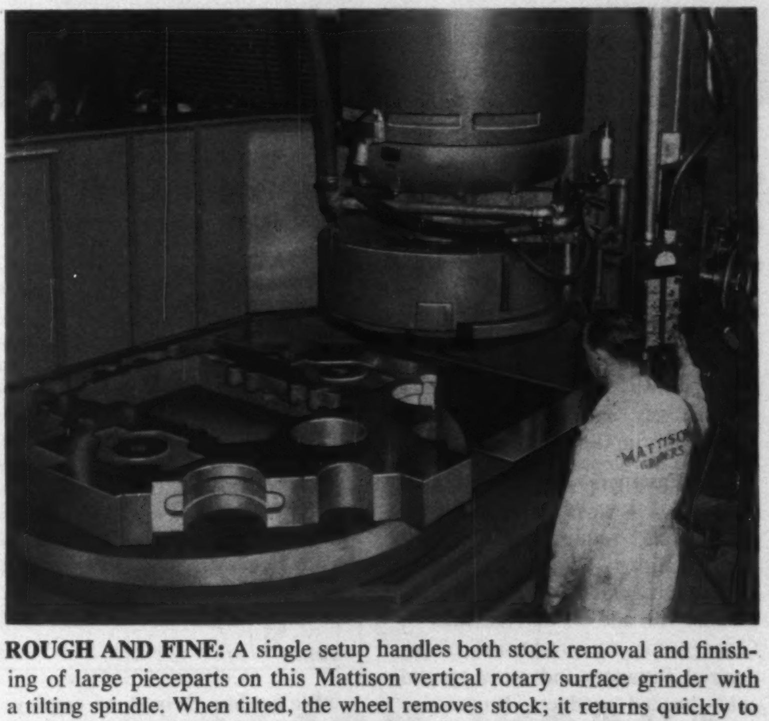
A good example is a new tilting mechanism designed for vertical spindle rotaries. Power quickly tilts the spindle for heavy stock removal at the start of processing. The leading edge of the wheel, where pressure is concentrated, is used to increase grain penetration.

Boosts Output — Without changing the setup, the piece is finish-ground dead flat by flicking the spindle back to true vertical position. Production increases on such machines average 50 pct or more, claims Alan C. Mattison, president of Mattison Machine Works, Rockford, Ill. Also, he adds, there's no sacrifice in accuracy or finish. Stock removal rates range from 7 to 12 cu in. per minute.

Look at grinding wheels in light of modern machining theory, suggests Mr. Mattison: "They not only present hundreds of sharp, hard ceramic cutting edges, but provide them in 'throwaway' form. In some of the new wheels individual grains fracture many times, automatically turning up fresh edges, before the whole piece tears away," he points out.

Low Piece Cost—Couple this action, which virtually eliminates downtime for servicing the cutting tool, with fast loading on magnetic chucks and you get high use factors, low piece cost.

Again, grinders being groomed for production are reported to embody latest ideas for in-process gaging, automatic cycle control. To be unveiled this fall, are a new planetary grinding head for surface grinders and a number of abrasive belt machines, expected to lend more versatility to production operations.



ROUGH AND FINE: A single setup handles both stock removal and finishing of large pieceparts on this Mattison vertical rotary surface grinder with a tilting spindle. When tilted, the wheel removes stock; it returns quickly to the dead-flat position for finish grinding. Such developments as this are aimed at exploiting the advantages of the grinding process.

INDUSTRIAL BRIEFS

Tea for Two—The Wean Engineering Co., Warren, O., will form a new company in Great Britain to furnish sheet, strip and tin mill equipment of Wean design. In association with John Miles & Partners, Ltd., who have represented Wean, a new company has been formed known as Wean-Miles Ltd. It will be jointly owned by Wean and John Miles.

Turning on the Heat—Turnkey Engineering Co., Inc., South Gate, Calif. has become a wholly owned subsidiary of The Electric Furnace Co., Salem, O. Turnkey designs, builds and installs metal cleaning equipment, spray booths, ovens, plating equipment, heat treating furnaces, air purification systems, materials handling and conveying systems.

Rolling in Alabama—Mesta Machine Co., Pittsburgh, has completed an automatically controlled reversing plate mill with two vertical edgers and auxiliary equipment for Republic Steel Corp. at Gadsden, Ala. The mill can roll reheated slabs into plate up to 126 in. wide. It will also operate as a reversing rougher to do preliminary rolling of steel slabs for the hot strip mill.

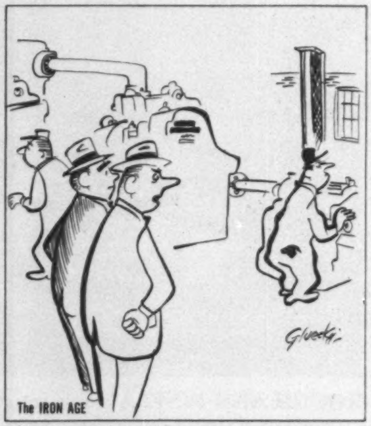
Nonferrous Research — Universal-Cyclops Steel Corp., Bridgeville, Pa., has a $500,000 Navy contract to cover process development in the production of molybdenum alloy sheet. Two alloys to be investigated are: Molybdenum-0.5 pct Titanium; and Molybdenum-0.5 pct Titanium-0.07 pct Zirconium. This contract is underway and is estimated for completion in 1961.

Add Fasteners—Pheoll Manufacturing Co., Inc., fastener manufacturers has acquired Progressive Manufacturing Co., Torrington, Conn., Div. of The Torrington Co. Pheoll will add to its facilities in Chicago for the production of industrial fasteners and other special cold-headed products. Progressive will operate as a division of Pheoll of New England, Inc.

Golden Gate Growth—Arthur G. McKee & Co., Cleveland will acquire The Western Machinery Co., San Francisco. The transaction will be through the use of cash and notes and will not involve issuance of any additional McKee common shares. Western Machinery will be operated as a McKee subsidiary with no changes in present management or personnel.

Atomic Answers?—Data on 1959 sales of fabricated metal products for the nuclear industry is being sought by means of a statistical questionnaire issued by the Atomic Industrial Forum. The Forum invites U. S. firms with any degree of activity in this field to request the new questionnaire. It may be obtained from the Technical Service Dept., AIF, 3 East 54th St., New York 22.

East and West — An agreement between Litton Industries and Kobe Kogyo Corp., Japan, has been submitted for approval to the Minister of International Trade & Industry of the Japanese government and to the State Dept. of the U. S. It involves a working relationship in the microwave and other electron tube fields between the two organizations on a long-term basis. This will be Litton's first manufacturing relationship in Japan.



"We got him through an employment agency—they were having a clearance."

Along the Ohio — Armco Steel Corp. is planning to expand storage areas and handling facilities for iron ore, taconite pellets, ingots and scrap at its Ashland, Ky., Works. The ore yard will be widened to provide space for over a million tons of ore and pellets. A second bridge will be built soon. Cost of new facilities will be about $3.4 million.

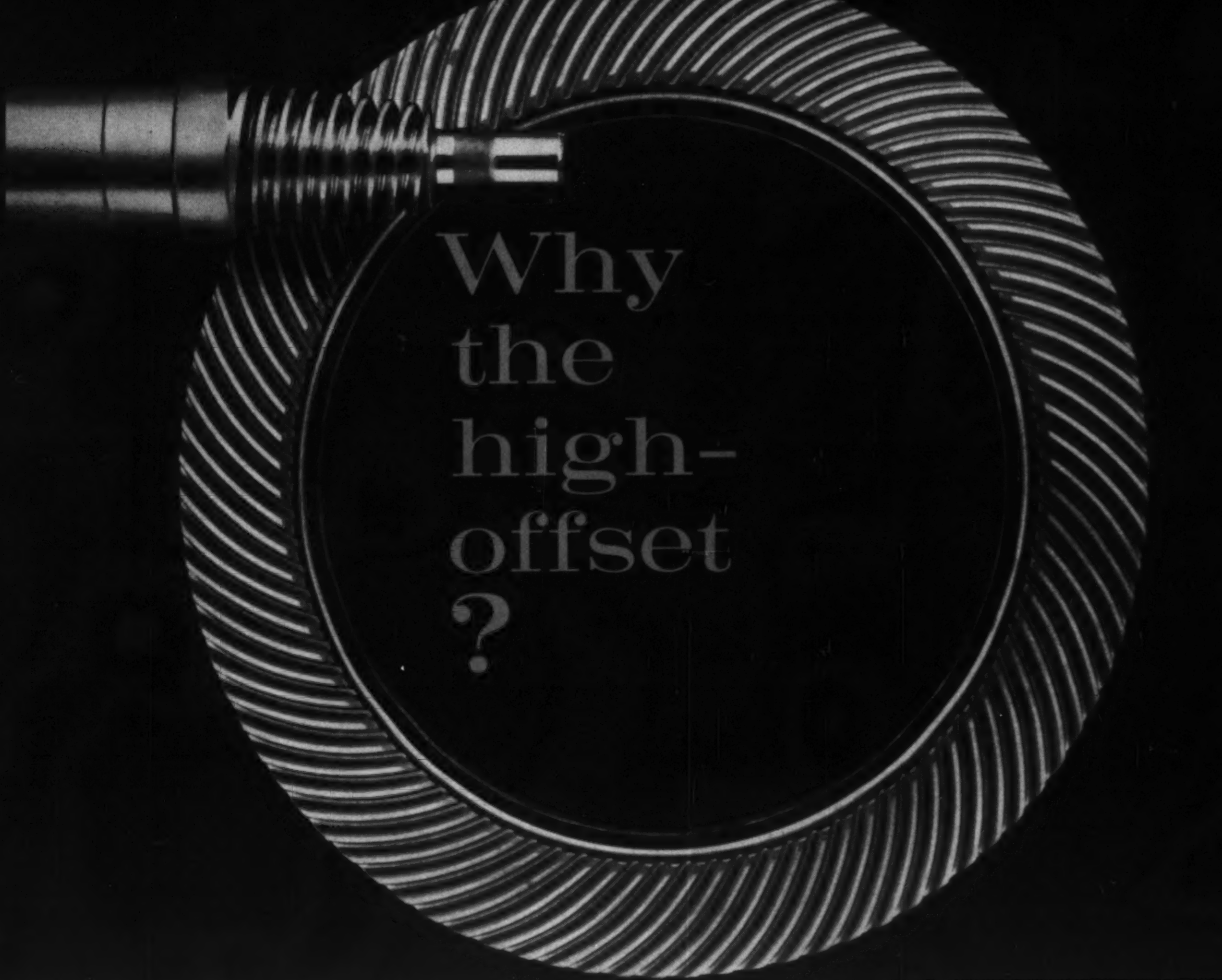
Heavy Air — Great Lakes Steel Corp., Detroit, has retained George D. Clayton Associates, air pollution and industrial health consultants, to study air pollutants in Ecorse and River Rouge, Mich. It will work with the steel company's Air Pollution Committee.

Fine Wire — The Nesor Alloy Products Co. has opened a new plant and sales and administrative facilities at 666 Passaic Ave., West Caldwell, N. J. The company produces fine drawn wire in all ferrous, nonferrous and precious metals. Facilities for wire, braid, strand, ribbon and component parts are also part of the new plant.

Big Blow — Wheeling Steel Corp.'s No. 1 Blast Furnace at the Steubenville Works has been taken out of service for a major rebuild and capacity increase project. It involves an expenditure of about $3 million. New equipment to be installed includes a turbo-blower with a capacity of 110,000 cu ft per minute.

Tank Savers—A $4.3 million order for production and special tooling of 212 welded hull assemblies for the U. S. Army's M-88 tank recovery vehicle has been let to the American Car & Foundry Div., ACF Industries, Inc. The vehicle weighs 55 tons and is designed to recover tanks disabled in maneuvers or actual combat.

Sooner Subsidiary — Yuba Consolidated Industries, Inc., San Francisco, has acquired Coynco Products, Inc., Tulsa, Okla. The Coynco plant will be expanded and developed into a manufacturing center for Yuba's shell-and-tube and air-cooled heat exchangers. It will be known as Yuba-Tulsa Corp.



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It's the difference that lets you combine *high-reduction* with strength, compactness and other advantages you might find profitable in certain applications. For instance . . .

For smooth operation—as in office equipment that must run quietly—high-offset pairs provide smooth, quiet tooth action. Because the teeth "wrap around" the pinion, *you get continuous action—even with just one or two teeth.*

Where space is a problem—as in instrumentation—the high-offset lets you design a more compact unit. Choose just the offset to solve your design problem with a more flexible, more compact unit than the corresponding worm and wheel.

Where you need strength—as in farm machinery—high-offset hypoid pinions with teeth, which tend to "wrap around," are larger and stronger than corresponding bevel pinions.

High-offset or high-ratio hypoids can be cut on the same Gleason equipment that is used on more familiar spiral bevel and hypoid gears. You can also use the same testers, quenching presses and other auxiliary Gleason equipment you're using now. Grinders are available for applications requiring precision finish. For ratios of 1:10 or 1:40 or even higher.

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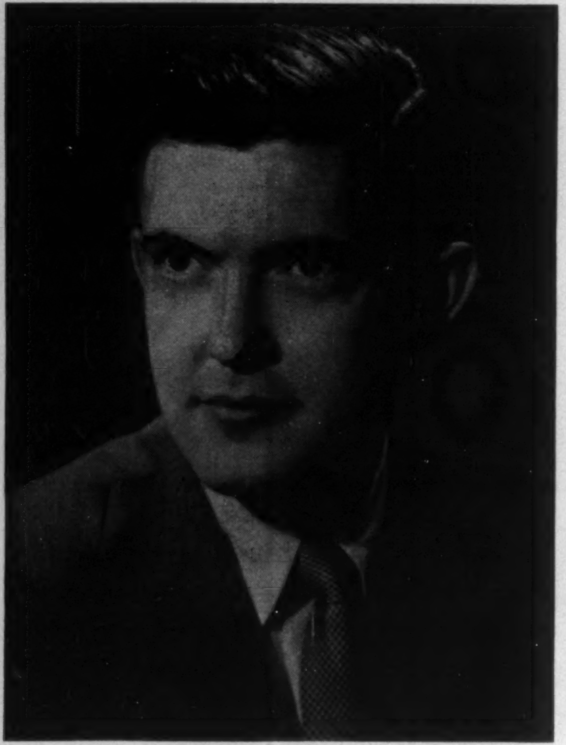
THE IRON AGE SALUTES: WALLACE MACGREGOR

He's an Experienced Young Man



W. MACGREGOR: Use the best talent possible.

At 43, Wallace Macgregor is an experienced leader in the metalworking industry.

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▪ Forty-three-year-old Wallace Macgregor, new president of Climax Molybdenum Co. and vice president of the parent American Metal Climax, Inc., brings a broad background in engineering economics to his new post.

Returning to Climax after serving as vice president of Homestake Mining Co., he again is associated with Frank Coolbaugh, new president of AMAX. He first teamed with Mr. Coolbaugh at Climax in the early 1950's to comprise one of the best production-financial teams in the industry.

Multi-Phase Leader—Mr. Macgregor is one of those rare executives who has been as preoccupied with research, engineering, production and sales as he has with finance. Though he places emphasis on profits, he believes also that profits should be reinvested in expansion and diversification to the extent necessary for a company to maintain competitive leadership in its field.

After early training in marine engineering, Mr. Macgregor was graduated from Harvard with a Master's degree in business administration. Throughout his civilian and military careers he has been associated with various aspects of the production and distribution of critical and strategic materials.

War Service — At the Navy Department during World War II, he had an active role in the Navy's part of the Controlled Materials Program. He also served on the staff of the Assistant Chief of Naval Operations for Material and, immediately before returning to inactive duty, was a logistics officer in the Eberstadt Group which formulated the original plan for the unification of the Armed Forces.

Following World War II Mr. Macgregor was associated with Coverdale & Colpitts, consulting engineers. With that company he participated in various feasibility studies leading to the financing or reorganization of several segments of the steel, pulp and paper and transportation industries. While he was associated with this company, he participated in the civilian reorganization of the Oak Ridge Directed Operations of the Atomic Energy Commission.

Live Catalyst—During Mr. Macgregor's previous association with Climax, he was instrumental in assisting officers of the company through one of the periods of the company's greatest growth, a time when employment rose from 500 to more than 2000. He was instrumental also in steering the company into the uranium, tungsten and other molybdenum by-product businesses.

Mr. Macgregor is one of the younger presidents of a major company. Before the 1958 merger with American Metal Company, Ltd., for example, Climax Molybdenum realized sales of nearly $70,000,000.

Voice of Experience—In speaking for a company with more than 40 years of experience in achieving the highest economic use of molybdenum, Mr. Macgregor says:

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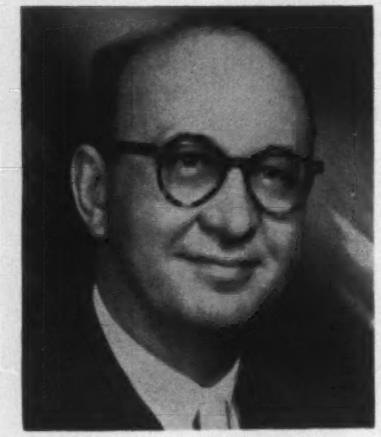

Hellmuth Strauss, appointed vice president and general sales manager, Walworth Co.

U. S. Industries, Inc. — **I. J. Billera,** elected executive vice president, operations.

Huck Manufacturing Co.—**L. F. Brown,** named vice president, manufacturing.

Republic Steel Corp. — **R. M. Miller,** appointed asst. superintendent, Electrical Dept., Massillon, O., steel plant.

National Malleable & Steel Castings Co.—**J. E. Fathauer,** appointed product manager, speedloader system.

Ex-Cell-O Corp.—**E. E. Conlin,** elected vice president, finance; **M. H. Knowles,** elected secretary; **E. J. Giblin,** elected treasurer; **R. D. Hughes,** appointed controller.

Dr. J. G. Donelson, named director, Applied Research Laboratory, U. S. Steel Corp., Monroeville, Pa.

Kasle Steel Corp.—**Robert Kasle,** promoted to vice president and sales manager, Detroit; **John Brown,** asst. vice president and sales manager, Grand Rapids; **Herbert Ockenfels,** asst. vice president and asst. sales manager, Detroit; **Leonard Trunsky,** appointed asst. sales manager, Detroit.

Inland Steel Container Co., Div. of Inland Steel Co.—**D. E. Malcolm,** appointed manager, industrial engineering for all plants; **C. E. Johnson, Jr.,** appointed manager, Chicago plant.

Armco Drainage & Metal Products, Inc.—**L. E. Welshofer,** named manager, personnel, and **R. E. Melampy,** industrial relations and safety advisor.

Kaiser Aluminum & Chemical Corp.—**C. F. Skoog,** named superintendent, coke - calcining plant, Gary, Ind.

H. K. Porter Co., Inc., Forge & Fittings Div.—**W. D. Fullerton,** appointed general manager.

Thomson Electric Welder Co.—**C. D. Moore,** promoted to sales manager; **J. C. Grant, Jr.,** becomes asst. sales manager; **G. R. Grant,** becomes factory sales engineer.

Dr. R. B. Mears, appointed asst. vice president — applied research, U. S. Steel Corp., Pittsburgh.

D. T. O'Connor, appointed director, research and development, Magnaflux Corp., Chicago.

Rea Magnet Wire Co., Inc., Div. of Aluminum Co. of America—**E. M. Wolf,** named technical director.

Electric Steel Foundry Co.—**N. J. Vanelli,** named asst. to the vice president, export.

Denver Equipment Co. — **J. E. Quinn,** appointed general manager.

Eastern States Steel Corp.—**M. A. Elshoff,** joins the staff as sales and warehouse manager.

Crane Co., Industrial Piping Products Div.—**A. H. Storch,** ap-

J. L. Stewart, appointed general sales manager, Universal - Cyclops Steel Corp., Bridgeville, Pa.

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pointed manager, field sales; **F. M. Schairer,** named manager, engineering sales.

Elliott Co.—**C. L. Hoebel,** appointed Eastern regional manager.

Havir Manufacturing Co.—**T. H. Havir,** appointed sales manager.

W. A. White, appointed sales development engineer, The Beryllium Corp., Reading, Pa.

Koppers Co., Inc., Engineering and Construction Div. — **C. K. Waibel,** appointed asst. manager, Coke Plant Sales Dept.

Thermoid Div., H. K. Porter Co., Inc.—**G. P. Robers,** appointed general sales manager.

United Welders, Inc. — **W. B. Tripp,** appointed plant manager.

United States Rubber Co.—**J. J. Orr,** named director, engineering.

R. S. Kocourek, promoted to manager, manufacturing services, Foote Bros., Gear & Machine Corp.

Dr. W. Wai Chao, appointed director, research and development, Vickers Inc., Div. of Sperry Rand Corp.

National Can Corp., Central Div. —**C. G. Wemlinger,** appointed quality control manager.

Split Ballbearing, Div. of Miniature Precision Bearings, Inc.—**E. M. Richardson,** appointed general sales manager.

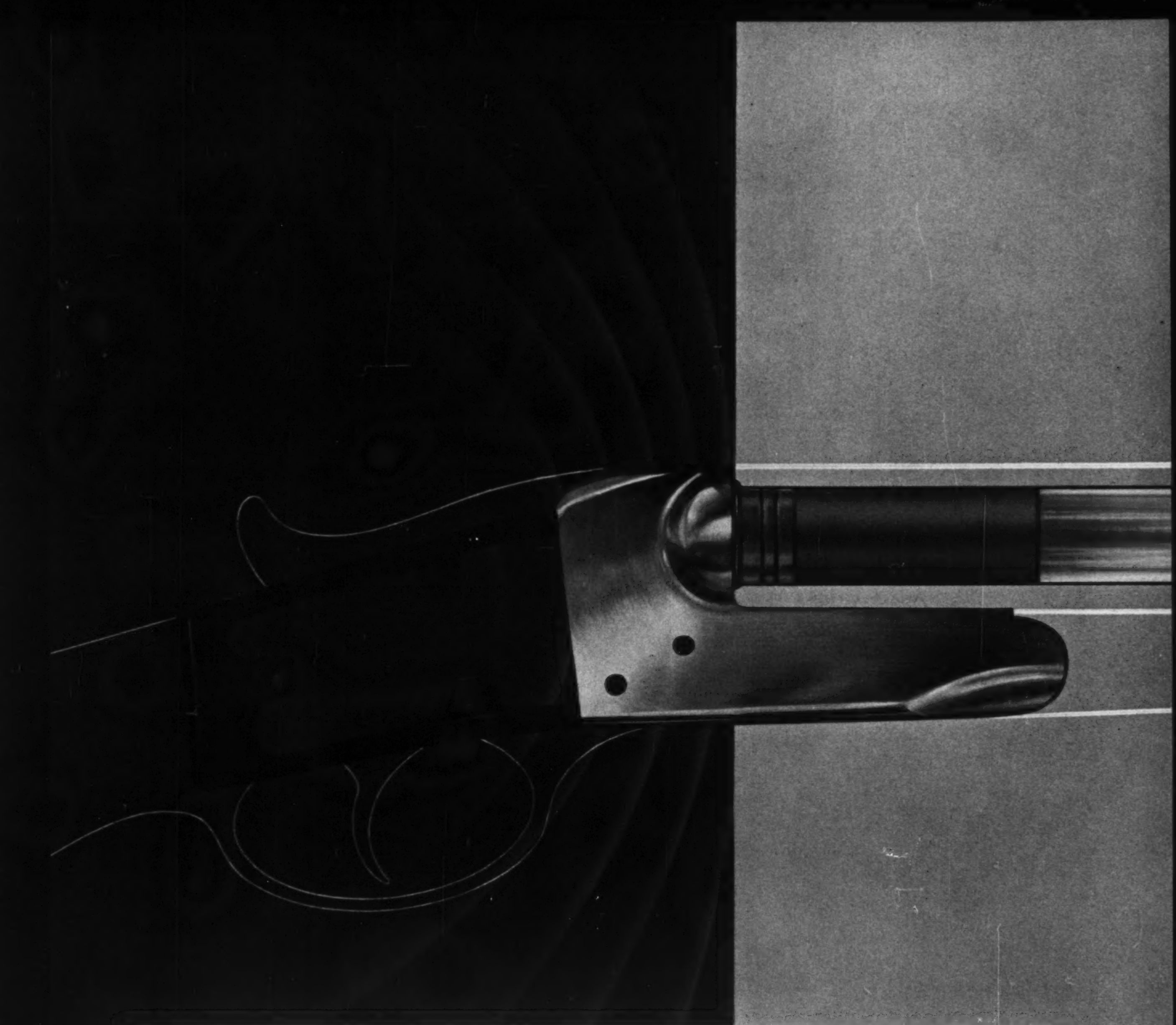
Universal-Cyclops Steel Corp.—**E. E. Hall,** promoted to asst. general sales manager.

J. W. Carlson, appointed asst. general manager, Construction Machinery Div., Allis-Chalmers Mfg. Co.

Superior Tube Co.—**J. A. West,** appointed a field specialist.

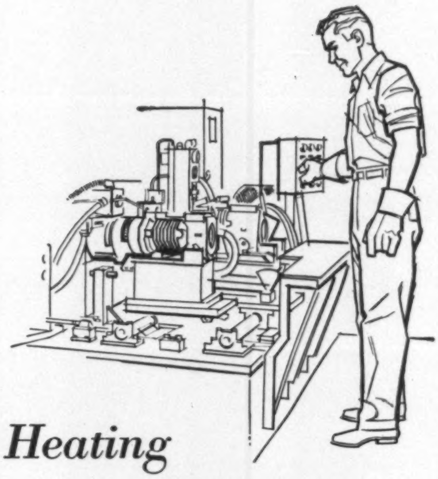
Mesta Machine Co. — **J. D. Campbell,** appointed asst. sales manager; **W. L. Wickard,** appointed auditor; **W. E. Diven,** promoted to

(Continued on P. 95)



How a **Shrink-Fit** E-x-p-a-n-d-s Profits

Copeland Saves $100,000.00 A Year



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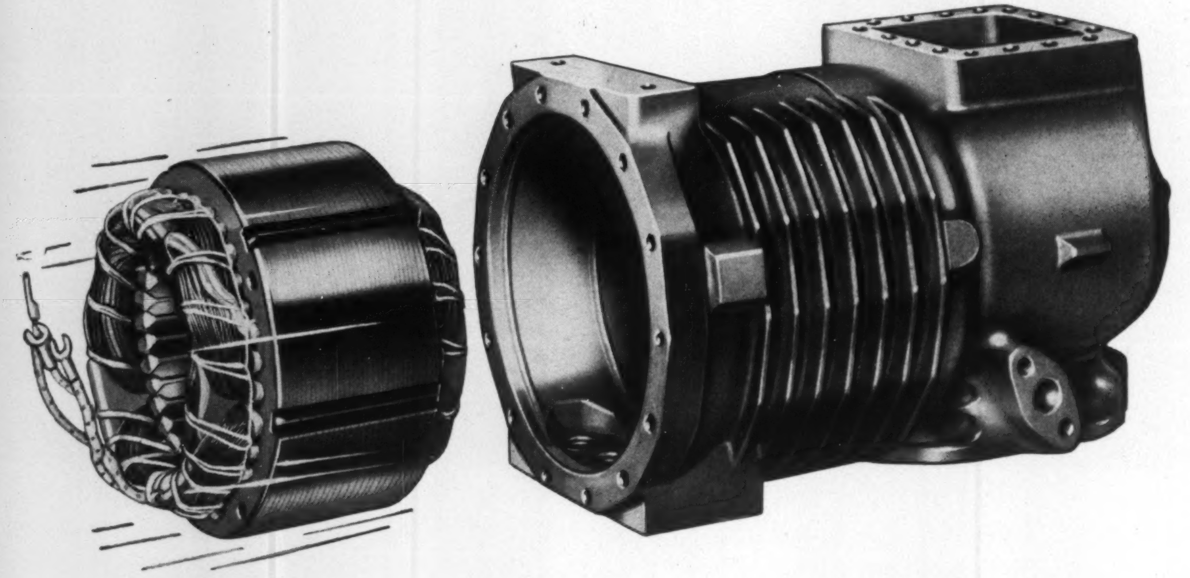

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(Continued from P. 92)

asst. auditor; **William Muirhead,** promoted to chief estimator.

H. B. Grant, appointed asst. to executive vice president, Mesta Machine Co., Pittsburgh.

W. J. Weir, appointed asst. to executive vice president, Mesta Machine Co., Pittsburgh.

S. W. Card Div., Union Twist Drill Co.—**Alan Mussen,** named field engineer covering Chicago and vicinity.

Wolverine Tube, Div. of Calumet & Hecla, Inc.—**C. T. Fuller,** appointed manager, special product sales.

OBITUARIES

C. G. Allen, 84, general manager and treasurer, Chas. G. Allen Co., Barre, Mass.

J. E. Fletcher, 62, superintendent, Sheridan, Lebanon County, Pa., blast furnace plant, E. J. Lavino & Co., Philadelphia.

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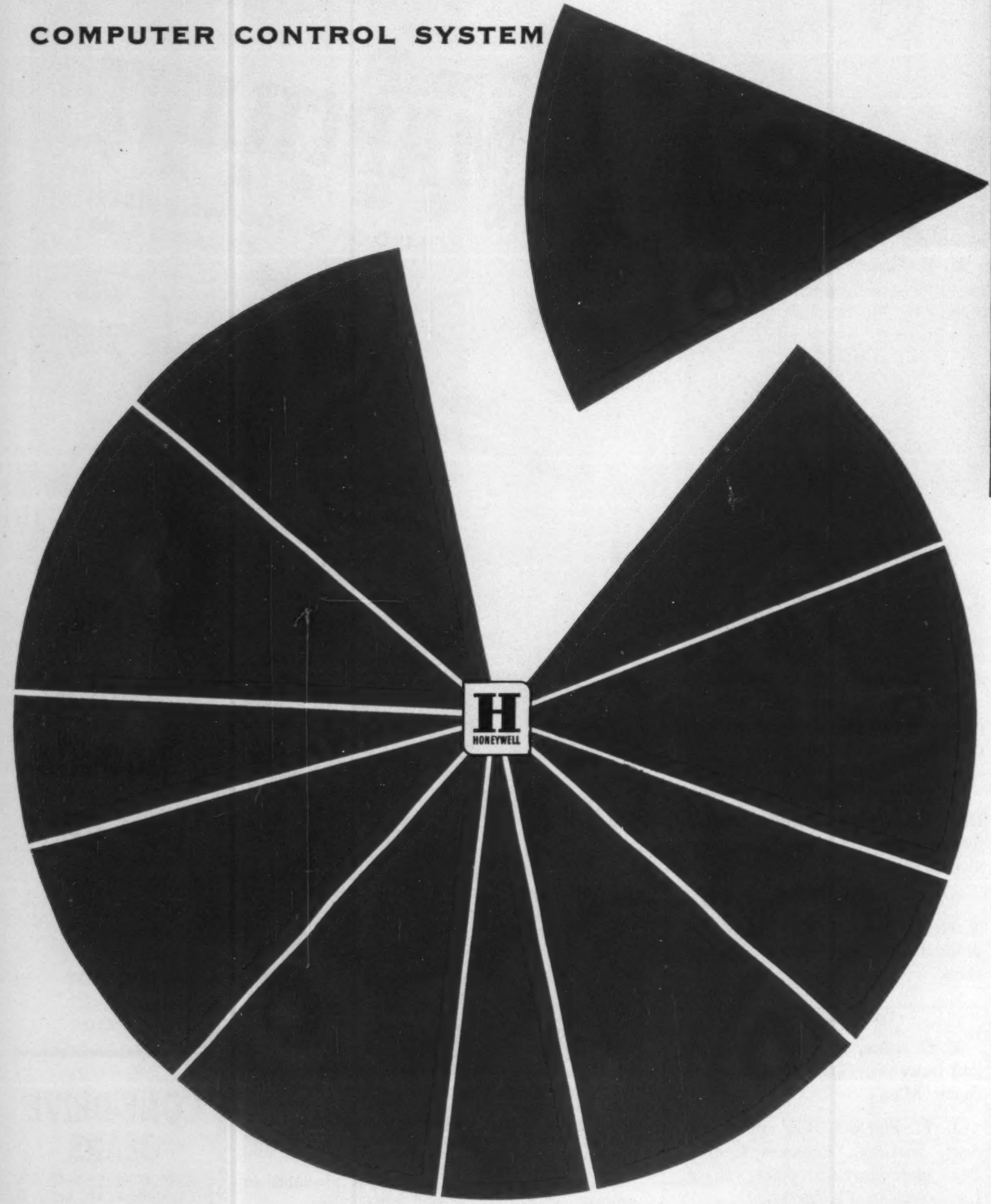

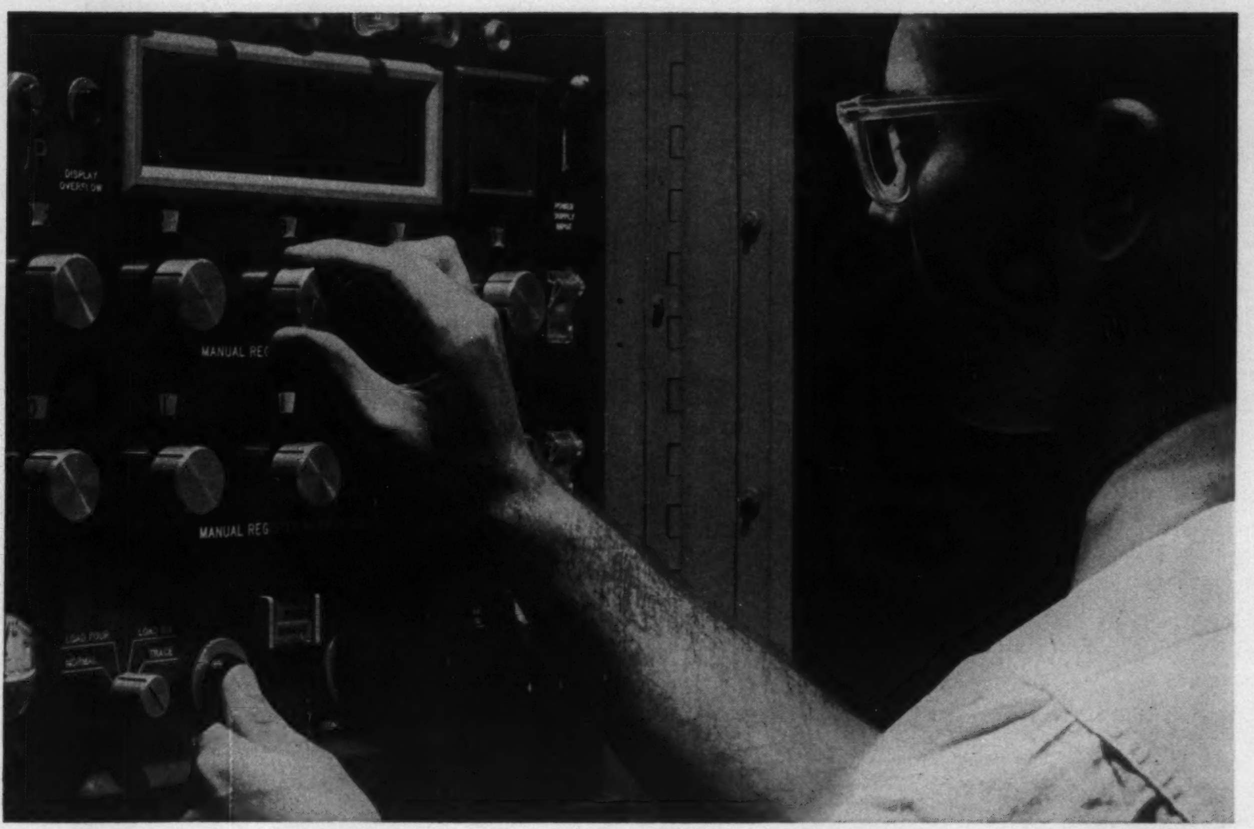

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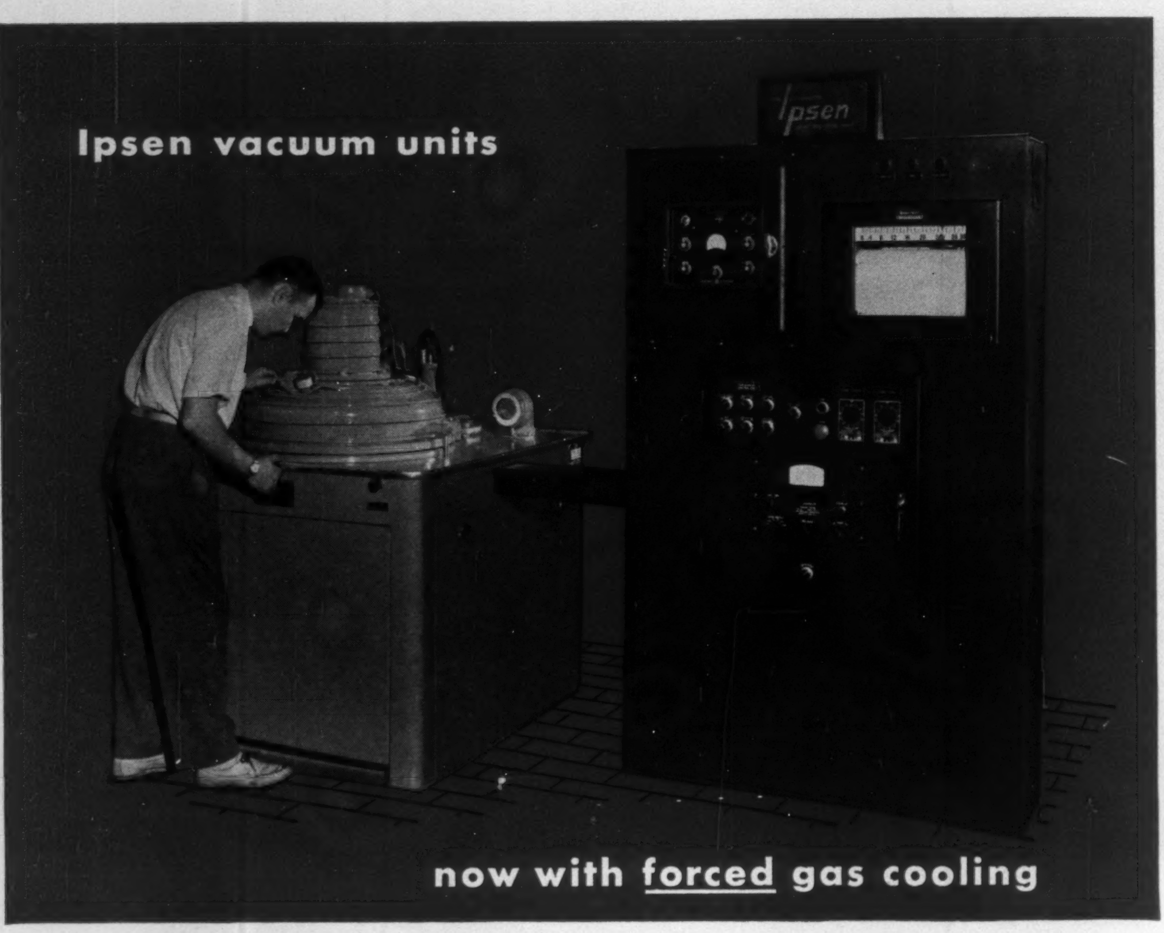

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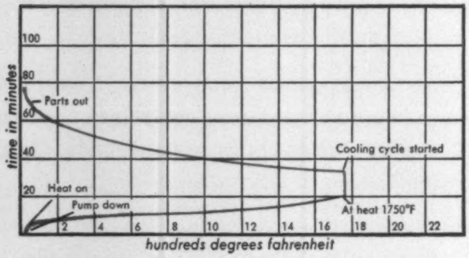
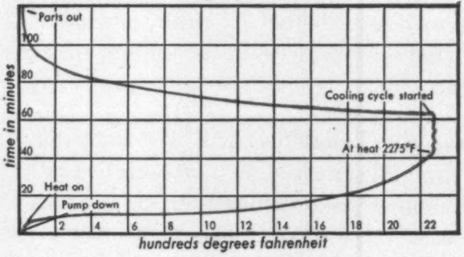


COMPLETE TIME CYCLE: 1 hour 8 min.
RESULTS: Rockwell C 42-43
APPEARANCE: Exceptionally bright

PARTS: Boring bars
MATERIAL: Rex M-2 High-speed steel



COMPLETE TIME CYCLE: 2 hours 10 min.
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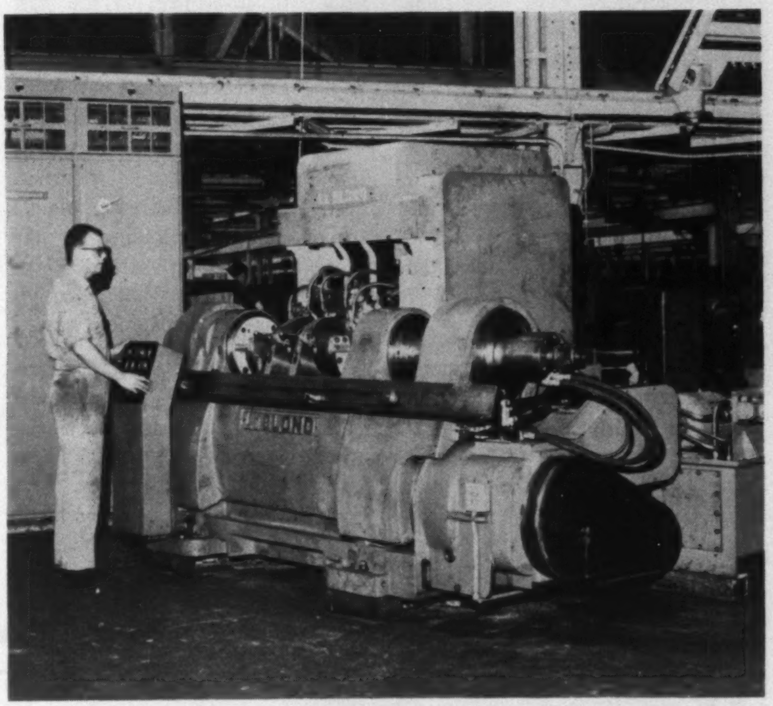
Package Concept Adapts Lathe To Crankshaft Machining

A complete tooling package creates a hybrid lathe. The new unit serves both as a general-purpose and special machine.

Developed for critical crankshaft turning, the design principle has wide potential use.

By R. H. Eshelman,
Machinery Editor



FULL DRESS: Package pin-turning lathe, with covers in place and workpiece in position, machines forged and cast industrial crankshafts.

■ One of the trends of the 1960's is toward equipment that gives job-lot shops automation advantages. Out in front of this parade is a new design concept. It centers on a basic turning unit to which a variety of tooling packages can be added.

Developed by The R. K. LeBlond Machine Tool Co., Cincinnati, the new design concept is embodied in an unusual crankshaft lathe. This lathe can be viewed as a hybrid. It's a combination general-purpose and special machine. In early tests it promises to be as hardworking as a Missouri mule—and just as adaptable to a variety of needs.

Trends in Automation — The drive to make special machines do more and more is far from new. Many transfer lines are adopting this policy. But LeBlond's approach appears to be the first practical solution to a mounting problem in the metalworking industry.

Many sizes and types of engines and crankshafts are constantly being spawned. Among these products are industrial and marine engines, both diesel and gasoline types. Materials vary. They include drop- and press-type forgings, as well as several shell-cast irons and steels.

The new crankshaft lathe handles them all. Special gearing, master-copy parts and tool settings are included in a removable-tooling package. This insures efficient operation. It also speeds the change-over to other sizes and types of crankshafts. The new design provides manual operation or full automation.

Production Gap—R. E. LeBlond, president, explains that his company has long been aware of a growing gap in production technology. Consumer-market demands have converted the large automakers into job-lot processors.

Mr. LeBlond states: "We have realized for several years that special crankshaft lathes have application only in very high production. To change-over present machines is a very time-consuming job. Usually it means sending them back to the builders' plant for complete rebuilding. There just is no machine for people of relatively low production."

Cut Capital Costs — An interchangeable tooling package should hold a lot of appeal for financial management. It represents a major breakthrough in capital - investment barriers. This breakthrough will open a new avenue for modernization of old or outdated equipment.

Compare capital and tooling costs

for standard crankshaft lathes versus the new design. Assume 100 pct for original cost of the standard units. The new package-type lathe will run only about 60 to 70 pct. But, retooling present crank lathes runs up to 70 or 80 pct of original costs. In addition, retooling takes 45 to 60 days.

By contrast a new tooling package costs about 20 pct of the original cost of a standard lathe. Tooling is about 30 pct of the package lathe's cost.

Change-over time averages a day. It may run from 12 to 36 hours in some shops. Production rate on a standard dual-spindle crank lathe is from 10 to 70 parts per hour—depending on the job. The new lathe turns out from 10 to 35 parts per hour.

Flexibility Saves — For many shops, flexibility is more important than top hourly production. LeBlond engineers report that even in many automated crankshaft lines, the new lathe blends well with the production rates of present equipment. With this machine, it's easy to run four-cylinder cranks from one line, then switch over and run six-cylinder cranks as the work schedule dictates.

In the marine and industrial-engine fields, and even in European auto plants, the crankshaft has always proved a production bottleneck. An investment in the new equipment can smash this bottleneck. And such an investment can be justified because of the new unit's flexibility. Production-time savings over present methods would become tremendous. Savings in unit-part costs can quickly justify the original capital outlay. Retooling by the economical-package method allows maximum machine utilization. It also boosts the recoverable capital investment.

Good Features — Basically the package crankshaft lathe is a single-spindle unit with multiple-cutting tools. It takes rapid cuts to face counterweight lobes and it turns all pin bearings in a single machining cycle. The unit uses the LeBlond principle of imparting orbital tool motion around the spindle center with two master crankshafts.

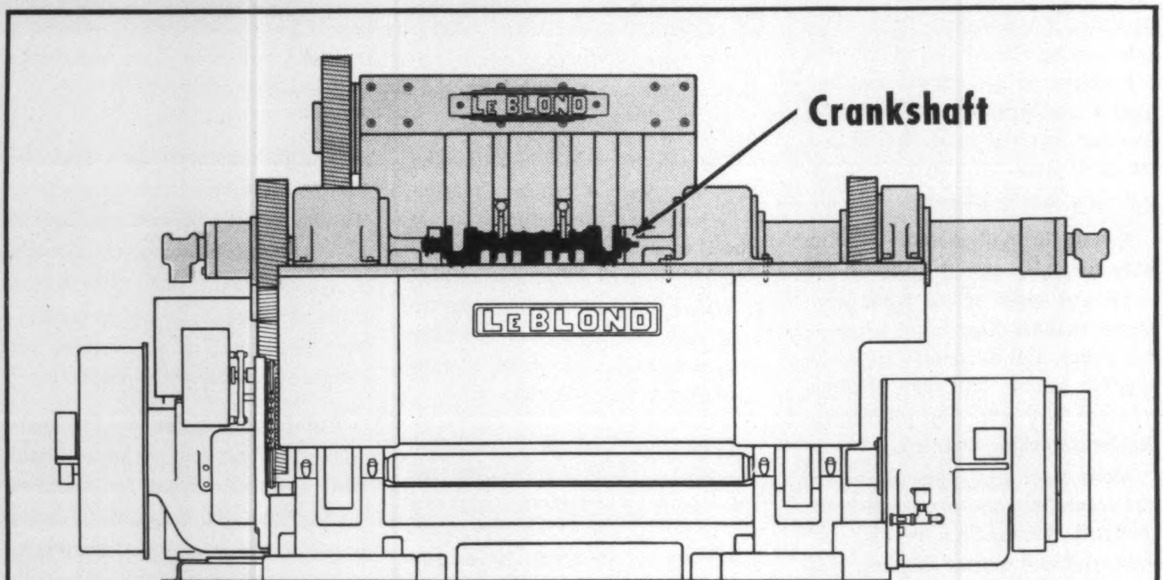
Master cranks, geared to the heads, are part of the tooling package. The package also includes tool slides, holders and cutters.

The lathe handles forged or cast crankshafts with 2, 3, 4, 6 or 8 pins. The basic machine takes workpieces from 12 to 41 in. in length, with bearing diameters to 5 in.

How It Works—Hydraulic, push-button operated, pot-type chucks drive the crankshaft at both ends. Correct indexing depends on milled spots in the end counterweights. These spots locate in the chuck pads. End-wise location depends on locating points in the steady-rest cartridge.

Previous processing of line and end-bearing surfaces determines the accuracy that can be secured. If workpieces have been finish turned, tolerances for the pin-bearing di-

Interchangeable Tools Speed Work Flow



MACHINE DIVIDES: Interchangeable tooling (top) is secured to lathe with a dozen hold-down screws.

ameters and spacing between webs, stroke and index can be held to ± 0.005 in. If these surfaces have been previously ground, tolerances can be held to 0.003 in.

To remove the tooling package, first the safety covers are taken off. Next, a dozen base bolts are removed. The entire package can then be picked up by a crane through eyebolts.

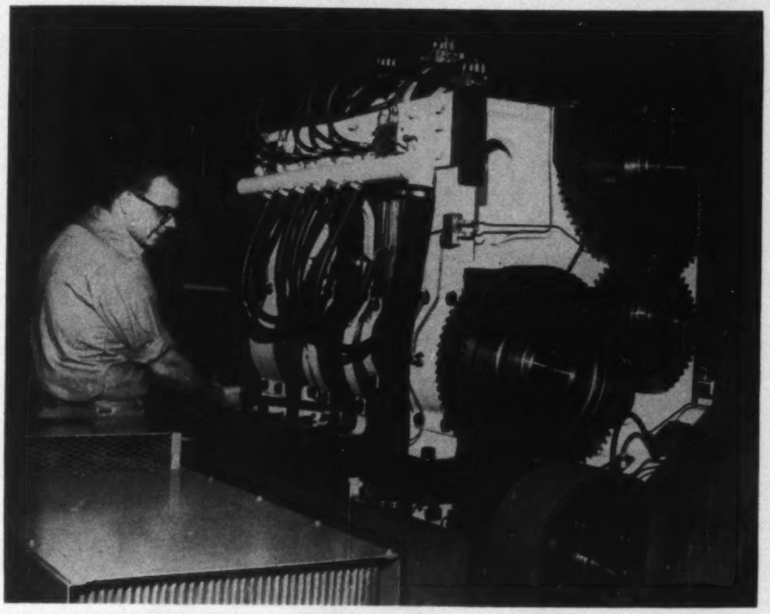
Fast Cycle — A prototype unit operates on either manual or automatic cycle. For manual work, the operator actuates each function by individual pushbuttons. However, the steady rests are locked by a lever. From the control console the operator sequences chucking, rapid traverse, start and stop and the position of the spindles for unloading and machining.

In the automatic cycle the operator merely closes the chucks and steady rests, then he pushes the cycle-start button. The machine runs through the complete cycle—including rapid traverse in and out. Spindles automatically stop in the proper position for loading and unloading.

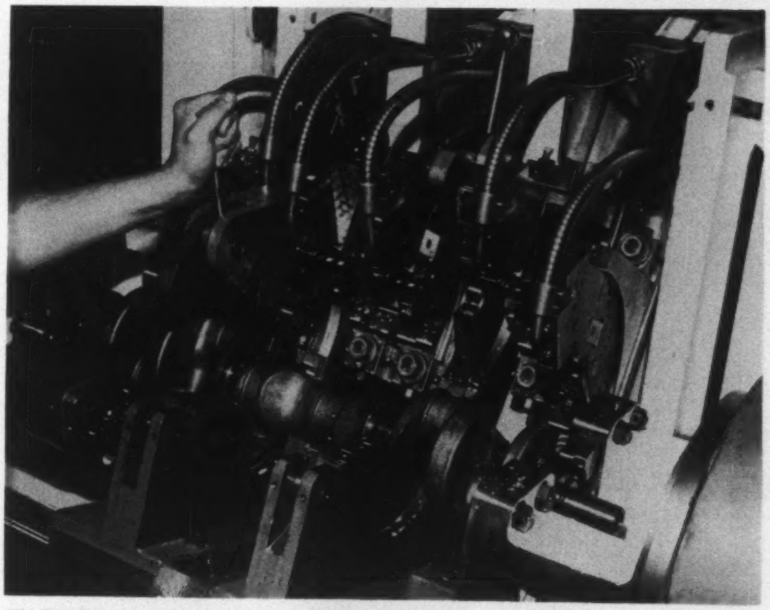
Production rates vary from 10 to 35 parts per hour. This rate depends on the material and the depth of cut. Early tests show that the machine can handle up to 40 nodular-iron cranks per hour.

Many Advantages—From a potential user's viewpoint, there are a number of nice features in the new design that aren't immediately apparent. For example, the prototype lathe is expected to give a user six-months lead on the target date for two different engines. When counted in from the beginning of an engine program, even greater gains in lead time and pilot production can be expected. Educated guesses range up to 50 pct.

Indications are that crankshaft makers may expert a tidy cost saving when producing service crankshafts for previous models—if the package concept is used. Reduced inventories also result. In fact, the package concept reduces the knotty problems of service parts for both tooling and production.



OPEN VIEW: After removing safety covers, operator loosens hold-down screws. These screws secure package tooling to the basic machine.



FAST LOAD: Operator clamps steady rests on crankshaft. Then he closes the chucks. The loaded workpiece is ready for the machining cycle.

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Diecast Parts Combine Strength With Multi-Purpose Finishes

A new aluminum alloy, which offers strength and beauty to finished parts, opens the door to high-production diecasting.

Jobs that once were impracticable now take on added possibilities.

▪ A new horizon is open for aluminum diecasting. Color anodizing, brazing, welding and porcelain-enamel coatings can now be applied practicably — and on a production basis. An alloy has been developed which accents possible new uses for the metalworking industry. This alloy is called Hamiloy, a product of Hamilton Die Cast Inc., Hamilton, Ohio. It combines high physical properties with decorative end uses.

To produce the new alloy, normal casting habits are altered slightly. Troublesome gases such as hydrogen and oxygen are controlled to produce sound castings with very good surface finishes.

How They're Cast — It's necessary to use the vacuum diecasting method for making the exotic castings. This process removes the obstruction of gases which might otherwise build up in die cavities.

The automated delivery of molten metal provides added flow properties which in turn make sound, surface-clean castings. The vacuum approach draws the metal automatically to the machine rather than ladling.

The metal can be cast at just the exact temperature desired. Casting machines were altered to control the distance that the molten aluminum must travel to reach the die.

AUTOMATED FEED—Diecasting under vacuum produces parts that are free of defects. The aluminum is strong yet gives beauty of finish.

Takes Crisp Color—Hamiloy diecastings are readily anodized. Colors such as black, gold, green, blue, pink, lavender and clear (or silver) are produced with a crisp and uniform appearance.

The colors can also be broken down to give various shades of each color. Three basic finishes can be applied to the part automatically or manually — depending on the shape of the part.

The matte finish is a non-directional surface, automatically prepared. It runs from dull to semi-gloss. The satin finish is a brushed, directional surface. It takes on a semi-gloss appearance.

The bright finish is a non-directional surface buffed bright. The gloss is such that it prompts the question if the parts are lacquered or not. This condition is peculiar to the Hamiloy metal.

Has Strength Too—The alloy is not of the high-purity aluminum variety, which has low physical properties. The compliment to Hamiloy is its tensile strength of 37,000 psi and its yield strength of 24,000 psi.

Also of prime importance is its 5- to 7-pct elongation factor which permits bending rather than fracturing. These figures represent averages computed in extensive tests.

Other tests show that the castings maintain shape and surface conditions even after being placed in a controlled oven for 30 minutes at 1050°F. Castings can be successfully dip brazed from the same temperature.

The machinability of the new alloy is very good. Charts are not available on its exact rating, but it is said to be similar to zinc in machinability.

No Silicon—Because of the absence of silicon, the alloy buffs to a high luster and also accepts a beautiful chrome plate. Users can now invest in a casting die and from it obtain parts that can be anodized, porcelain enameled or chromium plated.

Where parts have not been diecastable—because of internal back drafts—it is now possible to make large or small hollow parts. The parts can then be welded or brazed together to form the most intricate of assemblies.

Varied Uses — As a result of Hamiloy's various advantages, it is being considered and used in many different industries. The aircraft industry is interested in the alloy's light weight, high strength and decorative finish for functional parts.

One part is already being used in conjunction with aircraft seating. Architects have come up with still another use. It serves as a fitting for holding various tubes in exterior or interior applications.

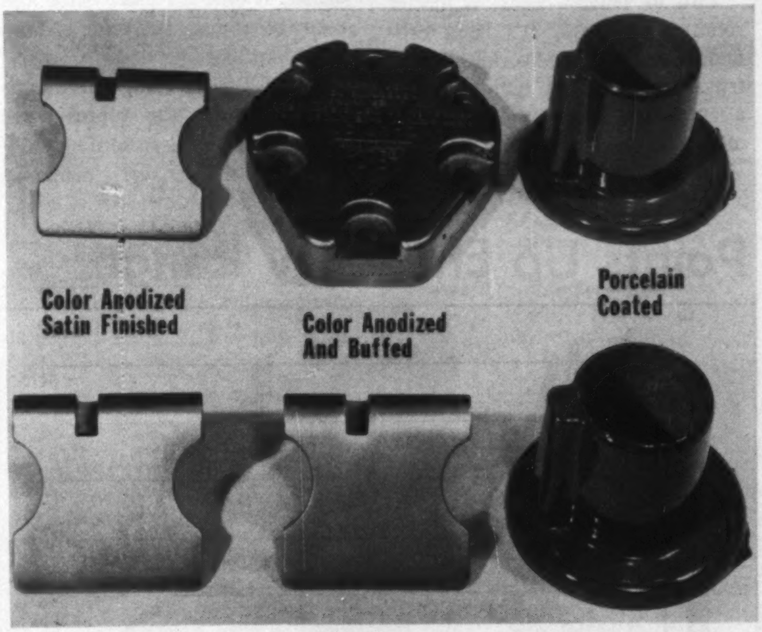
The fitting must have a high tensile strength combined with good elongation properties so that it can bend rather than fracture under overloads. In addition, color anodizing has enhanced its appearance.

Reduces Weight — A camera manufacturer is interested in using Hamiloy to replace zinc which was chromium plated. This will reduce the weight of the camera but still maintain the beauty.

A company that makes packing glands has completed tests and is ready for production of aluminum flanges. These flanges will be diecasted and welded into tubing. This will provide seam-tight connections for the packaging program.

It's easy to see why this new alloy has caught on so fast. Designers have capitalized on the chance to insert lightweight-aluminum diecast parts wherever possible. Former limitations made diecastings impractical for all production uses. But they have now been overcome to open new areas of opportunity in design.

HOLDS SHAPE—Parts diecast of aluminum can be welded without distortion. The welds are sound both internally and externally.



TAKES MANY FINISHES—Because aluminum diecastings can accept any of a variety of finishes and colors, they'll find many new uses.

Math Approach Puts Machining In High-Efficiency Range

When it comes to cutting speeds, some shops abuse their machines; others baby them.

Calculations of the proper speeds can be easy. A new high-efficiency program shows how.

▪ The key to profit or loss in many metalworking shops lies in the use of machining equipment. Too often, this equipment is not used properly.

What's needed is a practical method for determining the most efficient cutting speeds for production machines.

Lots of Waste—There is lots of room for savings. It's been estimated that the metalworking industry wastes about a billion dollars a year by not using modern methods.

High-efficiency machining (Hi-E) is one answer to the problem. So reports the metallurgical products department, General Electric Co., Detroit, "Hi-E can be used in any metal cutting shop to save time. It will also find the balance between time cost and tool cost—which will provide the lowest ultimate product cost."

According to H. F. DeLong, manager of the department, the heart of the Hi-E principle was the concept that cutting tools are expendable to save costly time . . . time being the most expensive ingredient in any manufactured article. If time per piece is reduced, many other costs per piece go down in proportion.

GE has been using this mathematical approach to improved tool life for five years. According to W. W. Gilbert, manager, machining development service, Hi-E has been tried in many GE departments and has helped reduce their machining costs by factors as large as 10:1. Savings can now be measured in millions.

Abuses Equipment — Let's look at the two extremes when using machining equipment. One type of shop points out, "This equipment is costly. It must pay for itself. We have to turn out parts as quickly as possible."

Another shop believes otherwise. "This equipment is costly. We can't afford to keep sinking money into it. Let's baby it."

The first shop forgets that operating costs go up when a machine runs too fast. Tool costs increase. Downtime and machine repair skyrocket. Result: production suffers.

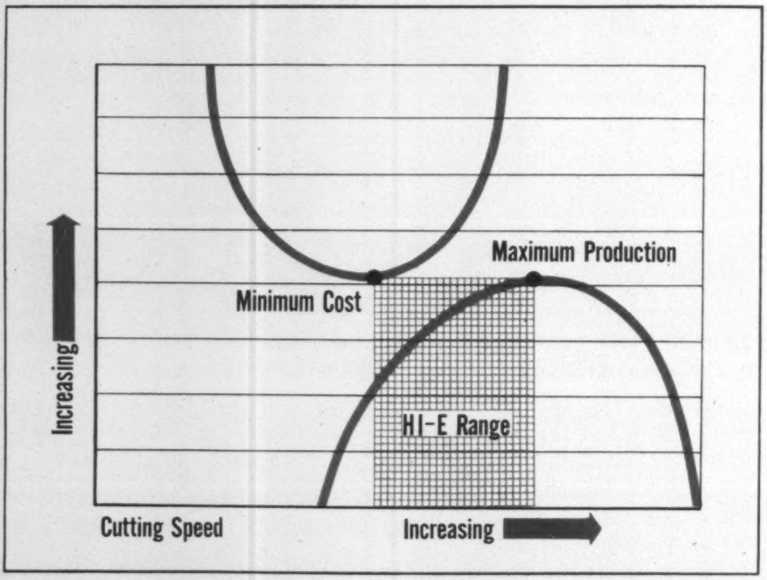
The second shop fails to realize that when a machine runs too slowly, it cannot pay for itself nor the man who operates it.

Obtains Balance — GE's high-efficiency technique, Hi-E, achieves a happy medium. It determines the cutting speed which will result in the lowest cost per piece machined. Or if cost is secondary, it will give the optimum speed for the maximum production rate.

To do this, the new method considers all factors vital to machining: tool life, cutting speed, output, labor, overhead, and tool costs.

The graph on this page shows the Hi-E curves. It is a reproduction from actual shop data. The curve at the left shows that, as cutting speed increases, machining cost falls off until a minimum-cost speed is reached. Then it quickly rises. The curve at the right shows that as production rate increases with cutting speed to a point of maximum production — then falls off.

Points Up Efficiency Range



KEEP WITHIN RANGE: Any speed in the Hi-E range gives a balance between minimum cost and maximum production. Any other is wasteful.

I. ENTER KNOWN QUANTITIES HERE

Symbol	Description	Quantity	Symbol	Description	Quantity
P	**Price of insert plus tool-holder depreciation (dollars)**	☐	**MR**	**Machine operator's rate (dollars per hour)**	☐
			MO	**Machine overhead rate (dollars per hour)**	☐
E	**Total cutting edges in life of insert (number)**	☐	**TCT**	**Tool changing time (minutes)**	☐

COMES FROM PLANT DATA: Known quantities are cost and time-study figures which can be gathered in the plant. Most are self-explanatory.

II. CONVERT KNOWN QUANTITIES TO DESIRED VALUES

A. ☐ (P) ÷ ☐ (E) = ☐ (t) — **Total tool cost per cutting edge**

B. ☐ (MR) + ☐ (MO) = ☐ (MRO) — **Cost of labor plus overhead per hour**

☐ (MRO) ÷ 60 = ☐ (M) — **Cost of labor plus overhead per minute**

C. ☐ (t) + (☐ (M) x ☐ (TCT)) = ☐ (C) — **Combined tool cost plus tool changing cost (per edge)**

TRANSFERS VALUES: The second step calls for transferring the known quantities from section I and doing some simple arithmetic.

III. CALCULATE TOOL LIFE FOR MINIMUM PART COST

Standard formula for carbide tools:

3.5 X (☐ (C) ÷ ☐ (M))

= ☐ Tc minutes

IV. CALCULATE TOOL LIFE FOR MAXIMUM PRODUCTION RATE

Standard formula for carbide tools:

3.5 X ☐ = ☐ minutes

TWO METHODS AVAILABLE: Tool life can be determined either by the work-sheet formulas or by use of a speedy hand-calculator.

V. CONVERT TOOL LIFE TO CUTTING SPEED

(See the reverse side of this form for instructions.)

	Desired Tool Life		Corresponding Cutting Speeds			
Minimum Part Cost	☐	(Tc)	☐	fpm	☐	rpm
Maximum Production Rate	☐	(Tp)	☐	fpm	☐	rpm

OBTAINS CUTTING SPEED: After tool life values have been calculated, the next step is to convert them to cutting speeds in fpm.

Any speed in the Hi-E range gives an efficient balance between minimum cost and maximum production. Any speed outside the Hi-E range sacrifices both cost and production.

Simple and Fast — Similar calculations have been made in the past; but they have been lengthy and complicated. Hi-E's approach is simple and fast—and with no loss in accuracy.

All it takes is GE's new slide rule for calculating speeds, feeds, and depths, the instruction booklets, and some revised work sheets to ease data handling.

Consider this example. A forger of railroad axles prepared a chart plotting cutting speeds versus tool life—based on production testing. It took 200 hours to complete. Calculation by the Hi-E method, giving almost the same results, took only ten minutes.

How to Calculate—Here's how it works. First, set feed at the highest rate that will produce an acceptable finish. Now, you're ready to calculate the proper cutting speed.

The proper work sheet must then be selected. There is a sheet for disposable carbide inserts. Another sheet is for brazed carbide tools, on-end carbides or any other regrindable tool.

The known quantities, the only information required for the work sheet, are then entered in section I. These are cost and time study figures which can be taken in the plant. Most are self-explanatory. Note that each item is given a special symbol to ease further computations.

Math Is Simple—Section II is where the known quantities are converted to desired values. This step, which merely calls for simple arithmetic, gives the basic values for computing tool life and cutting speeds.

The work-sheet formulas in sections III and IV, for computing tool life, are straightforward. One is for minimum part cost; the other is for maximum production rate. The same results can be obtained with the calculator. The instruction booklet provides machinability ratings and directions on how these calculations can be made.

The calculator figures cutting speeds in fpm from the tool-life values. To convert fpm to rpm, simply flip the calculator to the "productivity" side, set cutter or work diameter under the fpm value, then read rpm over the arrow. Rpm is then converted to cutting time.

Check Machinability Scoreboard

Material*	Work Material Number	Bhn	Machinability** Rating
C-1010	0.50	150	0.55
1040 (castings)	0.60	190	0.45
3140	0.80	197	0.55
4130	0.80	183	0.65
4340 (spheroidized)	1.00	206	0.65
4620	0.70	170	0.65
E-52100	0.50	206	0.30
AMS 6418	0.70	195	0.50
Cast iron (chilled white)	0.70	500	0.10
Malleable (pearlitic)	1.15	185	0.90
Ni-Resist	0.40	145	0.45
Hyten B	0.80	187	0.60
A-286	0.30	300	0.10
AM-355	0.40	360	0.10
Molybdenum (cast)	0.40	190	0.30
Waspalloy	0.30	270	0.12
Inconel	0.60	240	0.30
K Monel	0.70	240	0.35
303 stainless	0.80	180	0.65
17-4PH		388	0.28
PH 15-7 Mo	0.50	270	0.20
420 stainless	0.70	207	0.45
Leaded copper			2.40
Medium-leaded bronze			2.10
Muntz metal			1.20
Leaded silicon-bronze			1.80
Cupro-nickel			0.60
Zinc			2.00

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* AISI or SAE rolled or forged materials unless otherwise noted.

** This is a sample list from some 250 rated materials in the Hi-E instruction booklet.

Check the Results—This cutting speed figure is not infallible. Run the job at the calculated trial speed and measure the actual tool life. If it varies from the desired tool life, reduce the cutting speed. If actual life is longer, increase the cutting speed. Then check tool life again.

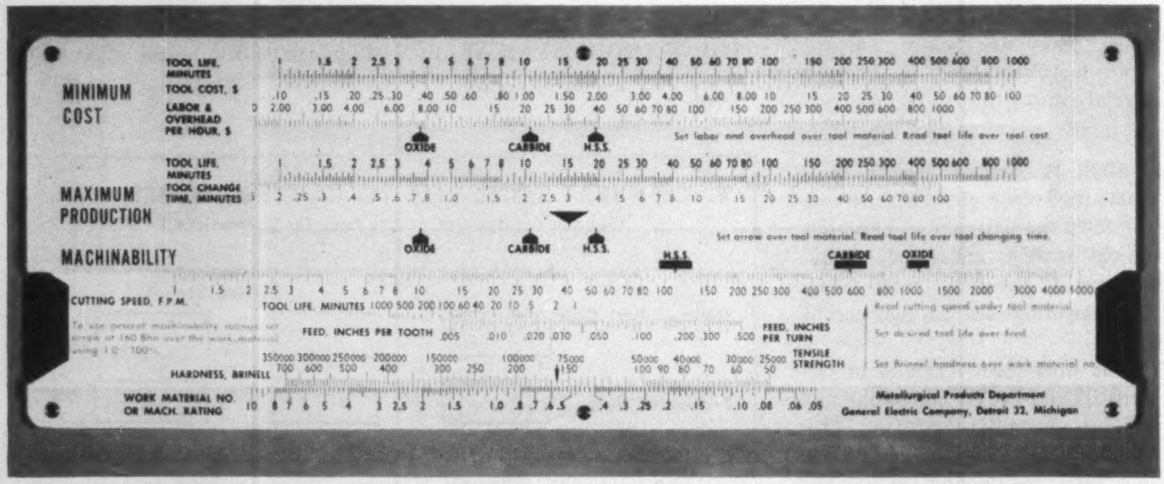
"When actual tool life is the same as desired tool life, your job is set at the best cutting speed for production efficiency."

Proves the Point—There are any number of case histories than can be cited to point up the benefits of Hi-E. Take the story of a roller bearing company.

Company management knew that they had to obtain the lowest cost-per-piece in their machining. Otherwise, they couldn't compete. They also knew that they would get neither the highest production rate nor the best tool life.

The Hi-E technique was consulted to find out the speed at which to run their machines to give the lowest cost-per-piece. Calculations with the slide rule came up with a cutting speed of 420 rpm to produce parts at minimum cost, and a cutting speed of 510 rpm to produce parts at a maximum rate.

For the company, it meant a new production and cost-per-piece ratio which allows it to be more competitive in the bearing field.


MINIMUM COST
TOOL LIFE, MINUTES
TOOL COST, $
LABOR & OVERHEAD PER HOUR, $
OXIDE
CARBIDE
H.S.S.
Set labor and overhead over tool material. Read tool life over tool cost.
MAXIMUM PRODUCTION
TOOL LIFE, MINUTES
TOOL CHANGE TIME, MINUTES
Set arrow over tool material. Read tool life over tool changing time.
MACHINABILITY
CUTTING SPEED, F.P.M.
TOOL LIFE, MINUTES
Read cutting speed under tool material.
FEED, INCHES PER TOOTH
FEED, INCHES PER TURN
Set desired tool life over feed.
TENSILE STRENGTH
HARDNESS, BRINELL
Set Brinnel hardness over work material no.
WORK MATERIAL NO. OR MACH. RATING
Metallurgical Products Department
General Electric Company, Detroit 32, Michigan

HANDY CALCULATOR: One side of Hi-E calculator has scales designed for determining desired tool life and converting it to cutting speed. Instructions for these scales are printed on the face of the calculator.

Nitride Bond Fills Ceramic Gap

Silicon-carbide refractories have great industrial potential. But this potential hasn't been realized—due to weak bonds.

Silicon-nitride bonds may be the answer. They resist corrosion caused by fused salts.

■ Tests prove the value of a new refractory product. Called Crystolon 63, this high-temperature material shows promise as a low-cost structural ceramic.

It has already been used as a liner in aluminum-reduction cells. Results show that the wall thickness of these cell linings can be reduced about 75 pct. In addition, less electric power is needed to operate the cells.

Good Potential—Crystolon 63, developed by the Norton Co., Worcester, Mass., is a nitride-bonded silicon-carbide refractory. It serves in the melting and alloying of costly high-purity metals and in the transfer of molten materials. Since it has a strong bond, it can be used as a structural ceramic.

Among the structural uses for the new refractory are package boilers, incinerators and kiln fixtures for the ceramic industry. The newcomer is also being tested for use in rocket nozzles and blast pads at launching sites.

Silicon-carbide refractories have high-thermal conductivity. They have good heat-shock properties. Also, they resist most corrosive liquids. Silicon-carbide grain shows little or no deterioration upon exposure to many molten metals and fused salts.

Seek Better Bond—For example, when silicon carbide contacts fused cryolite—which is the fluoride electrolyte used in the electro-chemical production of aluminum metal—it exhibits good corrosion resistance.

The material used to bond the silicon carbide determines the limit of the refractory's use. A conventional bond is an oxide or a silicate.

However, fused salts—such as cryolite—act as solvents for most oxides. Therefore, oxide bonds do not stand up as well. Other problems also crop up when oxide bonds are used.

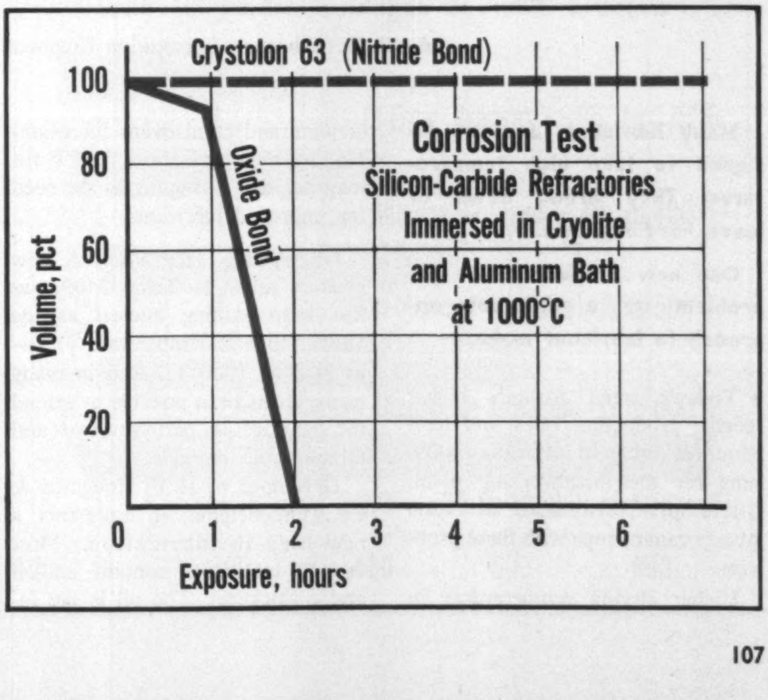
Metals such as aluminum and magnesium reduce the wet-oxide bonds to some extent. On the other hand, silicon-nitride bonds resist attack under the same conditions.

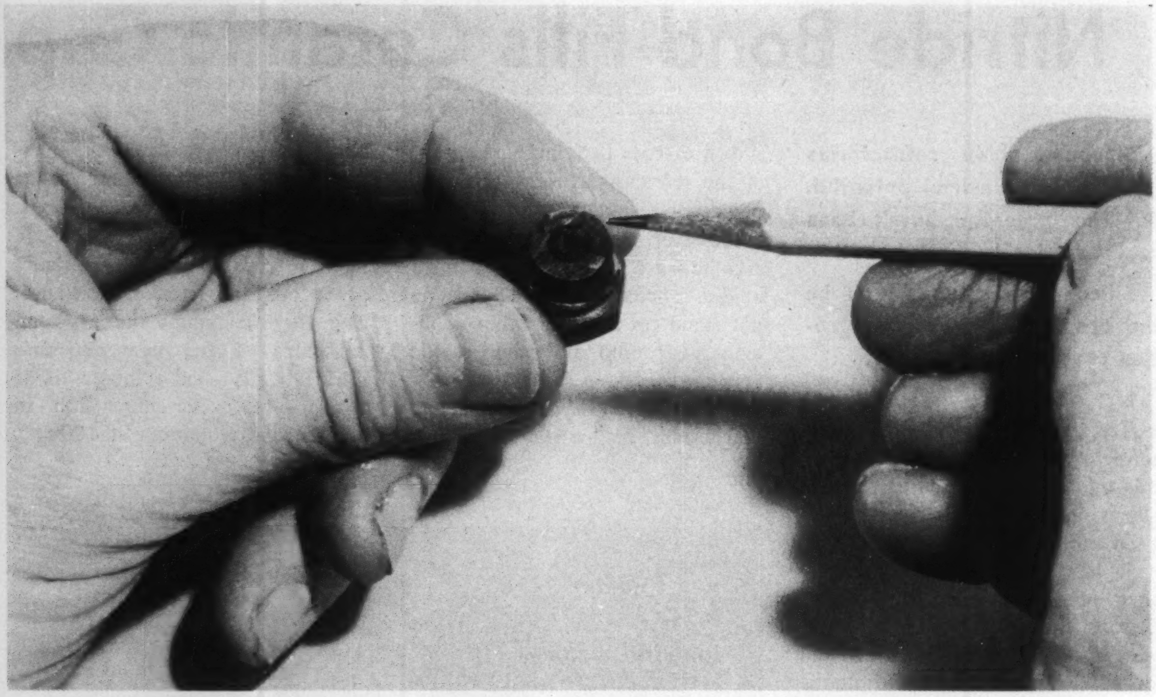
Tests with Crystolon 63 in molten cryolite and aluminum prove out its corrosion resistance. The chart compares the exposure resistance of the new ceramic's nitride bonds—and standard oxide bonds — to cyclic immersion in cryolite and aluminum at 1000°C.

Heat Strengthens Nitride Bond

MODULUS OF RUPTURE:	
At Room Temperature	6400 psi
At 1250° C	7000 psi
At 1450° C	3800 psi
RESISTANCE TO ATTACK BY:	
Molten Aluminum Metal	No Wetting after 168 hours at 800° C
Molten Zinc and Lead	No Wetting after 168 hours at 800° C

New Ceramic Resists Corrosion





CLOGS FITTING: One advantage of new synthetic lubricant is that it leaves no hard graphite residue to clog grease fittings. Thus, production doesn't have to be stopped while passages are cleared.

Synthetic Lubricant Holds Up On High-Temperature Jobs

By G. R. Arbocus—Lubrication Engineer, E. F. Houghton & Co., Philadelphia

Many lubricants are not designed to take high temperatures. They break down or leave hard residues.

One new product meets the problem by a different approach to lubricant makeup.

▪ Today's trend towards higher speeds, production rates and temperatures results in lubrication problems for the metalworking plant. Quite often, standard oils and greases cannot cope with these problems.

Higher drying temperatures in ceramic and paint ovens for example, are now well above 500°F for long periods. It highlights the need for improved lubricants.

Gives Long Life Also—A new product called Hi-Temp 2409, has fast been gaining interest as the answer to high-temperature jobs—as high as 1000°F. And in many cases, it has been possible to extend the relubrication period to two- and three-month intervals.

Developed by E. F. Houghton & Co., Philadelphia, it represents a new idea in lubrication. Most "solid" lubricants contain an oil and a thickener. The oil is the lubricant; the thickener carries the oil and holds it in place.

The Houghton approach differs. The new product uses the solid thickener as the lubricant. The reason: to provide protection after the carrier—the lighter portion—disappears. Thus, Houghton's Hi-Temp 2409 combines a synthetic carrying agent, a thickener, and a fine particle graphite.

No Residue Remains — Another advantage of the new lubricant is that after the carrier volatilizes, a soft film of graphite-based lubricant remains. There is no hard abrasive residue.

The ability to lubricate after partial oxidation makes the new product an ideal grease for a number of industrial operations involving kilns, ovens and conveyors.

Consider the kiln car. It's a very unromantic piece of hardware. But it is vital to brick makers and many ferrous and nonferrous producers and processors.

Lubrication of the roller bearings on these cars has always been a problem. When a heavy load of brick or metal is pushed into a furnace for heat treating, it's obvious that the car-bearing lubricant must be heat stable.

"Twilight Zone"—Even with shielding, wheel temperatures of 400°-700°F are not uncommon. This temperature range includes the "twilight zone" in which many conventional greases perform with mixed results.

In one plant, the temperature along kiln-car rails reaches 500°-700°F. Greases used would either break down due to the heat or they would clog grease fittings and lines with hard graphite. Production would have to be halted while the wheels were removed and passages cleared.

Hi-Temp 2409 was applied to the eight wheel bearings of two cars. After three passes through the entire drying and baking cycle, the bearings were found to be still effectively lubricated.

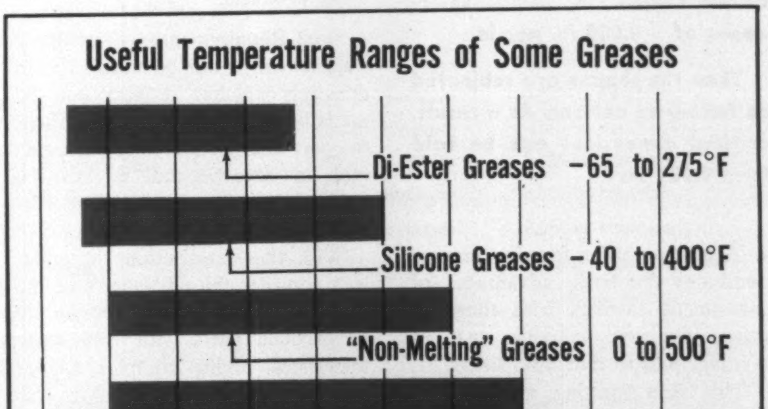
It was possible to pump new lubricant through the lines, which were not clogged. Moreover, washer-ring life on housings was extended. And hydraulic pressure, needed to pull cars through the tunnel, was reduced.

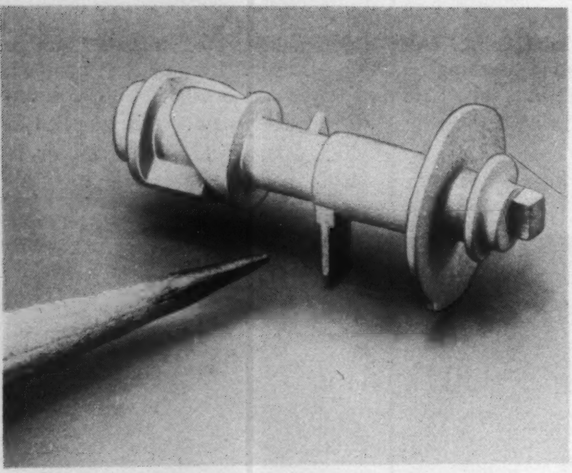
Serves Brass Foundry—Another case history is taken from a brass foundry. Hi-Temp 2409 is now being used as a lubricant in the tilting mechanism of charging ladles on melting furnaces. These gears reach a temperature of about 600°F.

Before the switch to the new product, various gear lubricants were tried. But carbonization of all products made weekly tear-down of these boxes necessary. How's the new synthetic lubricant doing? All that's required is some brushing on at only two-week intervals. No longer are the weekly tear-downs needed.

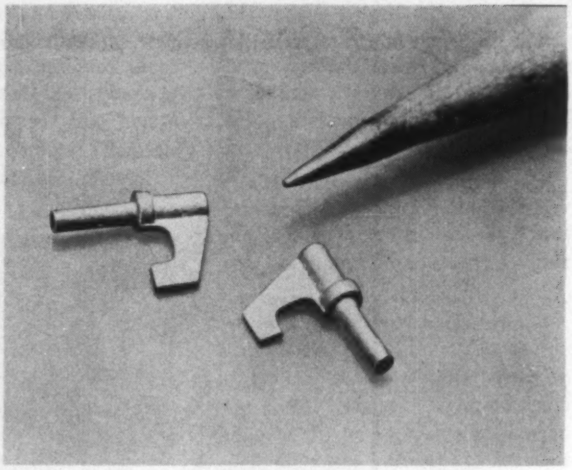
Houghton's new high temperature lubricant is rated as No. 1 grease consistency. It may be pumped, sprayed or brushed with conventional equipment. It is supplied in 400, 200, or 120-lb drums, or in 40-lb pails.

RESISTS HIGH TEMPERATURES: Wheel bearings of kiln cars may get as hot as 700°F. But the new lubricant holds up to at least 1000°F.





POWER SHAFT: Cast in chrome-nickel-moly steel, a power shaft controls a 35-mm camera's shutter speed.



DEFLECTOR CHADS: Critical dimensions are held within ±0.002 in. The tiny chads are used "as cast."

Tiny Precision Castings Allow Totally New Design Freedom

By J. H. Cadieux—President, Casting Engineers, Chicago.

Investment castings form precision shapes to initial tolerances of ±0.005 in. per in.

Then the shapes are subjected to follow-up actions. As a result, critical dimensions can be held to ±0.001 in.

- A new precision-forming process combines the basic advantages of investment castings with those of other precision methods such as coining, cold forming and sizing.

This new forming method, the Minicast process, provides totally new design freedom. At the same time, it produces precision parts at greatly reduced costs.

Since its recent introduction, Minicast has found quite a few uses. Why? Because of its ability to turn out complex, precision parts. Many of these parts serve in electronic equipment, machinery, firearms and other products.

Dual Requirements — Two basic requirements must be considered in deciding whether a part can be made by the Minicast process. First, the part must be less than one cubic inch in size. Second, it must be made in quantities exceeding 25,000 pieces.

With these restrictions in mind, let's consider the advantages of the process. These include the ability to produce parts with very close tolerances, highly complex shapes and superior surface finishes. Another advantage hinges on the fabrication of such parts in a wide variety of alloys.

Use of the investment-casting process to make the first "precision shape," results in initial tolerances of ±0.005 in. per in. Some dimensions can be held within ±0.003 in. per in. These tolerances are typical of the conventional investment-casting process.

Follow-up Action — By further subjecting the precision shapes to secondary operations—such as coining, sizing and cold forming—finished Minicast parts feature normal tolerances of ±0.003 in. per in. Critical dimensions can quite often be held to ±0.001 in.

For comparison purposes, the first table lists working tolerances of the new casting process. It also shows the tolerances obtained with other commonly used precision-production methods.

The Minicast process turns out small, complex figures. Cross sections measuring 0.025 in. are presently in commercial production. Of even greater interest are parts as thin as 0.020 in. The latter parts are the result of successful experiments.

Fine surface finish is another of

the process' features. The second table outlines this feature. Minicast parts are now in use which have a finish of 30-50 microinches. This finish depends upon the alloy used.

Wide Choice—Alloy selection is one of the prime features of the new process. As a rule of thumb, it's suggested that any alloy specified should have a high degree of fluidity. This insures proper flow in thin sections. It also prevents "shorts" or incomplete fills.

Generally such alloys also yield castings that have a good surface finish. Since close tolerances are often involved, this is important.

To speed the removal of gates, the selected alloys should be relatively brittle in the as-cast condition—or soft enough to be sheared. Due to their small size, most Minicast parts preclude conventional gate-grinding methods.

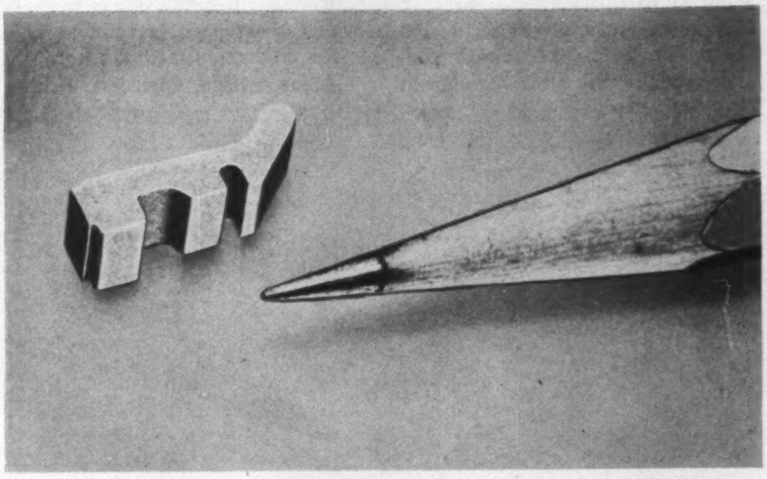
Many high-carbon steels, stainless steels, cobalt-chrome alloys and copper-base alloys can be specified for the new process. Major exceptions include: lead, tin, zinc, precious metals, high-purity copper, rare earths, titanium and magnesium.

Cuts Cost—Cost savings are possible with the process. Most of these savings relate to the elimination of secondary operations. These operations are normally required as a follow up for screw-machined parts, cold-formed parts, die castings, etc.

But to obtain substantial cost savings, production runs in excess of 25,000 parts must be realized. And the parts must be less than one cubic inch in size.

Since the basic shape of the part is made by investment casting, a number of components — formerly made by separate operations—can be combined into a single part. This eliminates multiple production. It also does away with assembly costs. In addition, the ability of the process to produce thousands of the parts per hour lowers the per-unit cost.

Simple Conversion—Contrary to common thinking, conversion to a



MINIATURE DOG: Cast in high-strength tool steel, a small dog serves in a quick-disconnect coupling. Costs have tumbled more than 25 pct.

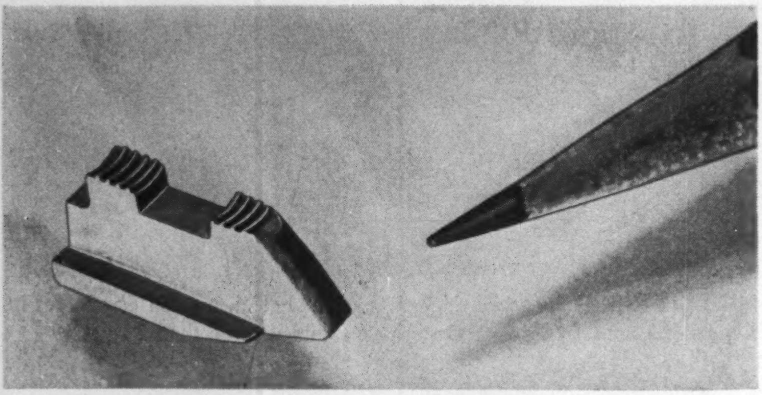
Compare Working Tolerances

TYPE OF DIMENSION	INVESTMENT-CASTING PROCESS	MINICAST PROCESS
Linear	±0.005 in./in.	±0.003 in./in. (normal) ±0.002 in./in. (at extra cost)
Angular	±½°	±¼°
Draft	0°-15′	none
Concentricity	0.005 in./in. of diam	0.003-in. total
Interior Corners	0.020-in. minimum radius	0.005-in. maximum radius
Exterior Corners	0.010-in. minimum radius	0.005-in. minimum radius
Wall thickness:		
Carbon Steel	0.060-in. minimum	0.030-in. minimum
400 Stainless	0.060-in. minimum	0.040-in. minimum
300 Stainless	0.050-in. minimum	0.035-in. minimum
Cobalt Base	0.050-in. minimum	0.025-in. minimum
Copper Base	0.045-in. minimum	0.025-in. minimum
Aluminum	0.050-in. minimum	0.030-in. minimum
Flatness	±0.005 in./in.	±0.003-0.005 in. (as cast) ±0.002 in. (coined)
Straightness	±0.005 in./in.	±0.003-0.005 in. (as cast) ±0.002 in. (straightened)
Machining Stock	0.010-in. minimum	0.005-in. minimum
Casting Mismatch at Parting Line	Normally 0.005-in. maximum (depending upon type of tooling)	Up to 0.003-in. maximum (depending upon type of tooling)

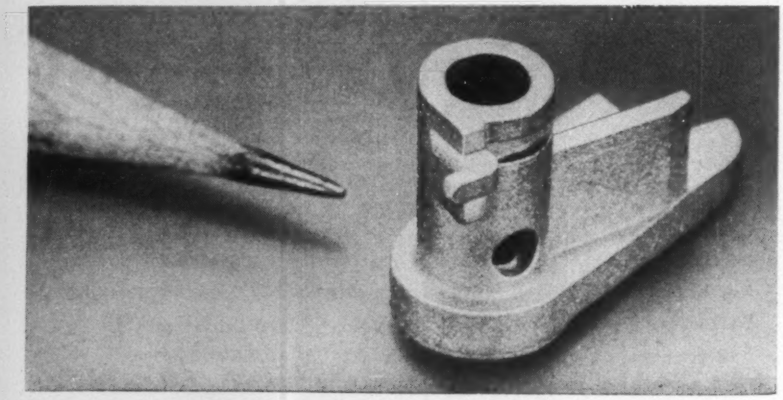
NOTE: The values represent those which can be reasonably held without price penalty. In specific instances, closer tolerances can be held. But more precise tooling, secondary operations and inspection may then be involved—usually at a proportional cost increase.

Minicast part—where the part had been made by screw machine, die casting or stamping—doesn't normally require any basic redesign in the part. There is one exception. Sometimes it's desirable to take advantage of certain design features which aren't possible with the previous production method.

Many design engineers believe that Minicast requires a complete change in basic design. Nothing could be further from the truth. About 75 pct of the parts now being made by the process employ the same blueprints that were used for older production methods.



FINE TEETH: The new process forms riveting-gun jaws from 4140 steel. These parts have teeth which are cast 0.010 in. wide by 0.010 in. deep.



SINGLE PIECE: Used on a vending machine's coin-changing mechanism, a single cast part supersedes an entire series of assembled stampings.

Surface Finish Is Improved

TYPE OF MATERIAL	CONVENTIONAL INVESTMENT-CASTING PROCESS	MINICAST PROCESS
Cobalt Base	60-rms average	40-rms average
400 Stainless	70-rms average	60-rms average
300 Stainless	60-rms average	50-rms average
Carbon Steel	90-rms average	70-rms average
Copper Base	65-rms average	60-rms average
Aluminum	60-rms average	55-rms average

Either process can be improved by secondary tumbling or burnishing.

Consider a case in point. The power shaft shown in the first illustration controls the shutter speed and the timing of a 35-mm camera. This small shaft was formerly made on an automatic screw machine.

Tight Tolerances—A cost savings of 67 pct results when the Minicast process is used to form these parts. Each shaft is now Minicast in chrome-nickel-moly steel. Tolerances remain within ±0.002 in. Simple drilling and teeth broaching are the only follow-up operations needed.

Abrupt changes in section thickness—usually difficult to obtain in "larger" castings—present no problem in these tiny components.

The next illustration shows two deflector chads. These parts were formerly stamped from a low-carbon steel, then machined and coined.

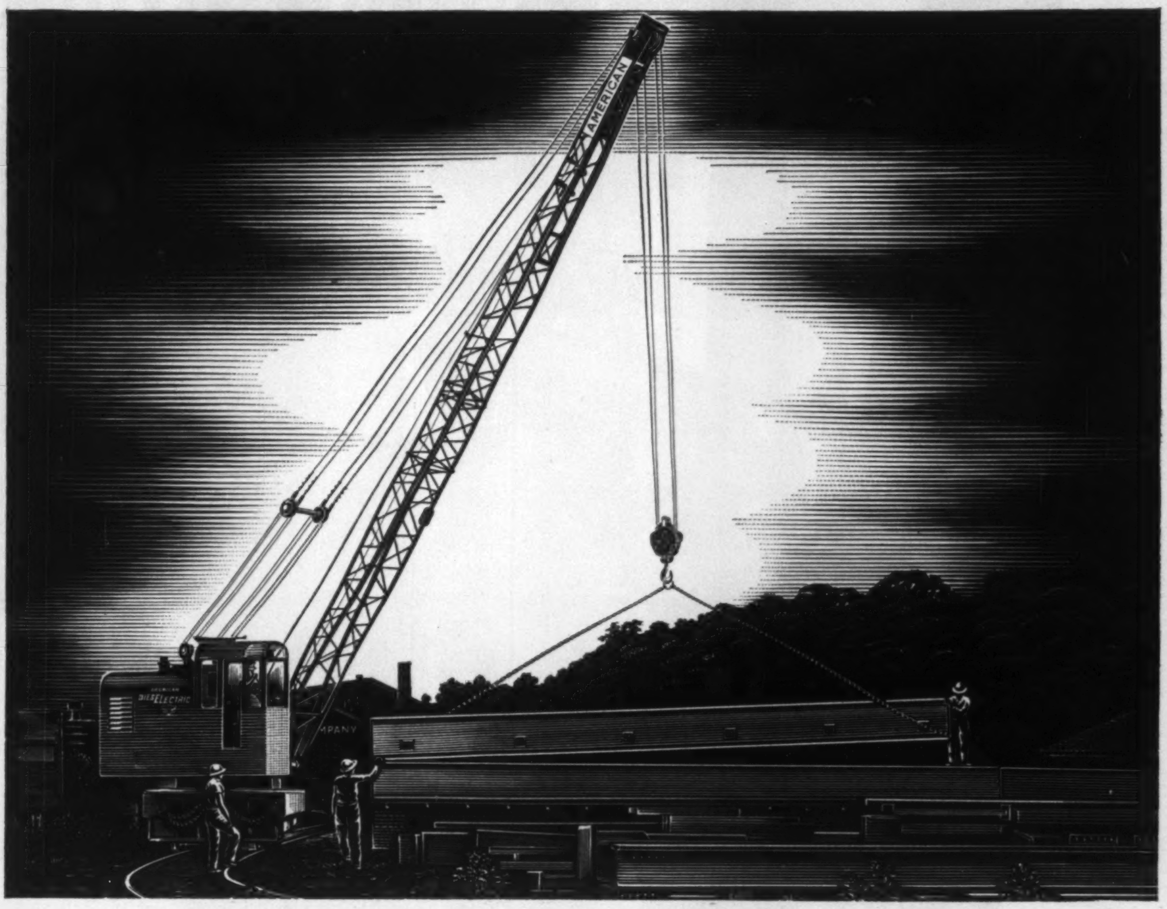
Now each deflector chad is Minicast in abrasion-resistant, silicon-manganese tool steel. As a result, the chad—which goes into a teletype machine—is used "as cast" at a savings of 62 pct. Critical dimensions are held to ±0.002 in.

Stronger Parts—The third illustration is a dog which serves in a quick-disconnect coupling for hydraulic and/or air lines. This part used to be extruded from carbon-steel-bar stock. Then it had to be milled and sawed.

Minicast in high-strength tool steel, the dogs now have improved tensile strength and better shock resistance. Costs have tumbled more than 25 pct.

Close-fitting threads and fine teeth are more readily machined than cast. However, tiny riveting-gun jaws are Minicast in fluid 4140 steel. These parts have teeth which are cast 0.010 in. wide by 0.010 in. deep with a 32 pitch. The overall-section thickness of each jaw is 0.058 in. This dimension is held to 0.003-in. total variation.

MORSE TOOLS HELP AMERICAN KEEP QUALITY...PRECISION



American Hoist & Derrick Company cuts cost... maintenance with Morse precision tools

For years economy of operation and low maintenance has been an outstanding feature at American.

So it follows they use Morse Tools during manufacture... because it takes top-quality, tough tools to build rugged machines. It takes Morse Cutting Tools... the best known quality tools on the market ... for smoother, faster machining and longer tool life.

For your cutting tool needs, it will pay you to order "Morse". Call your Morse Franchised Distributor today.

Morse means more production... smoother, more accurate production . . . with every type of cutting tool from drills, reamers, taps and dies, to end mills, milling cutters, slitting saws and "specials". So, if you want the best from every cutting tool you buy, mark your order "MORSE". For if you want *Morse Quality,* there's only one way to get it... *specify Morse.*

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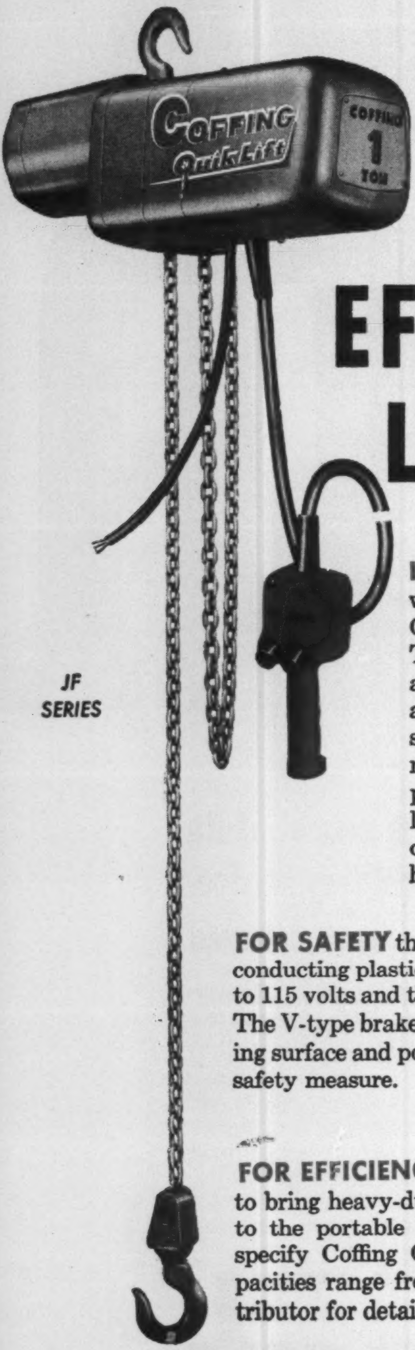

EASY
SAFE
EFFICIENT
LIFTING!

IT'S EASY to raise or lower loads while pulling a trolley mounted Coffing Quik-Lift Electric Hoist. The pistol-grip control station and the combination strain cable and control cord makes this possible. The light but strong aluminum housing provides ease of portability. Changing voltages, limit switch, type of suspension or chain is quick because the housing is in sections.

FOR SAFETY the control station is made of nonconducting plastic in which the voltage is reduced to 115 volts and the push-buttons are interlocked. The V-type brake which provides maximum braking surface and positive control of loads is another safety measure.

FOR EFFICIENCY this hoist has been designed to bring heavy-duty performance plus durability to the portable hoist field. It will pay you to specify Coffing Quik-Lift. Twenty models—capacities range from ¼ to 2 tons. Ask your distributor for details or write for Bulletin ADH-65.

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Ratchet • Screw
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PATENT REVIEW

New Patents In Metalworking

Economical Heat Use

Smelting furnaces, O. F. Swenson, June 14, 1960. In a method for efficiently utilizing available heat in the melting of pig iron, cast-iron scrap, steel scrap, iron-ore pellets, and the like, the hot gases from the melting zone are split into two fractions. Of these two fractions, one is returned to the hot end of sent through the preheating section. the melting zone and the other No. 2,940,744.

Hot-Top Lining

Apparatus for and method of providing a protective lining on a hot top, B. F. Anthony (assigned to Oglebay Norton Co., Cleveland), June 28, 1960. Method and apparatus for applying a protective plastic refractory layer to the firebrick lining of a steel ingot mold hot top. No. 2,942,319.

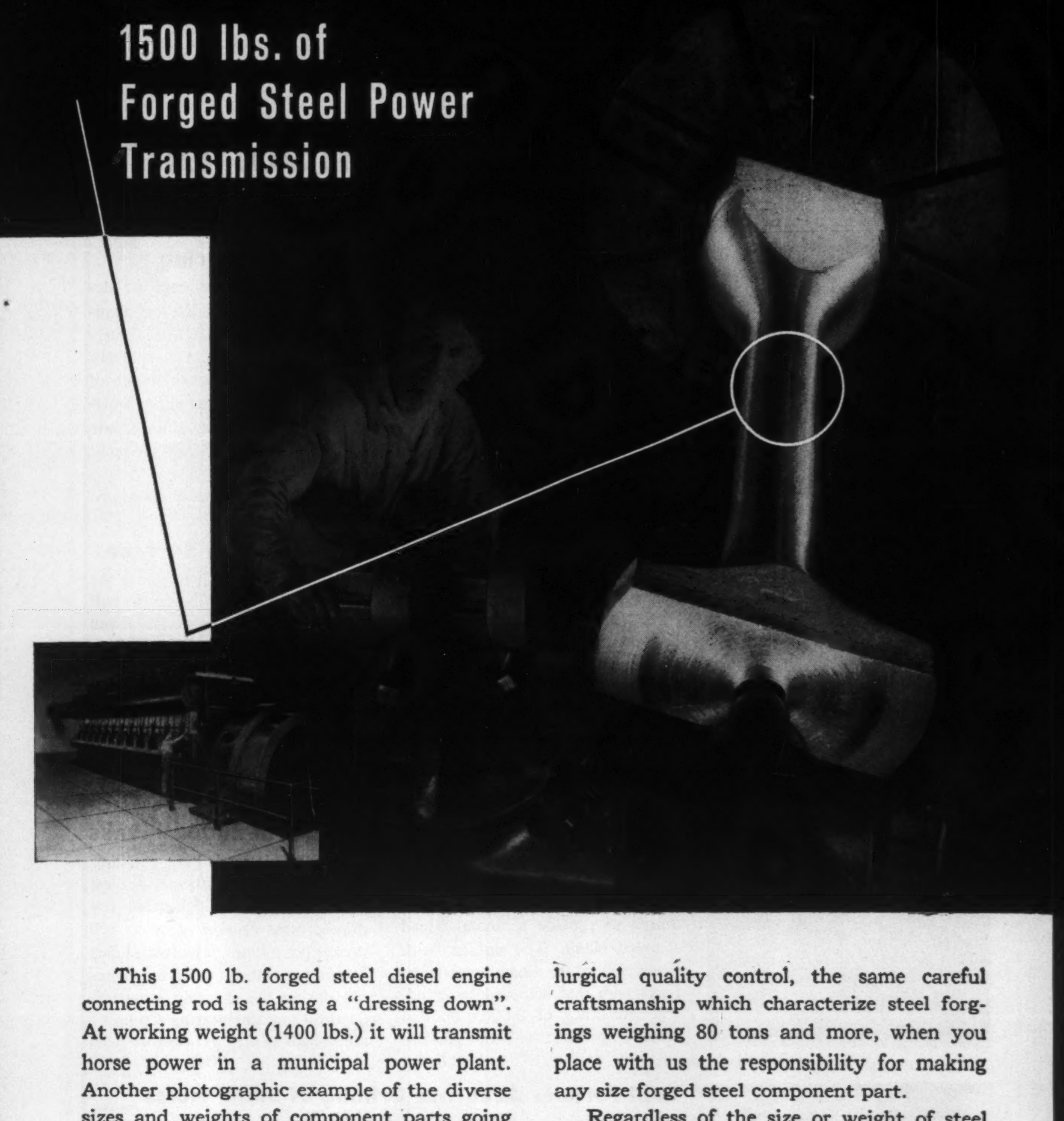
Ladle Valve

Hot metal valve for ladles and the like, L. Murarsheed, July 5, 1960. Design for a hot metal valve for use in the bottom of a ladle used in handling molten iron and steel. The valve is formed either of a refractory material only or refractory material with a metal core. No. 2,943,370.

Makes Screenable Ore

Process of drying and sintering ores, H. Rausch, K. Meyer and K. H. Lintermanns (assigned to Metallgesellschaft A.G., Frankfurt am Main, Germany), June 21, 1960. Method of sintering a two-layer iron-oxide ore bed, wherein the top layer is recycled, dried fine ore and the lower layer is wet, lump ore. The product is a screenable mixture of dried particles and heat-hardened particles. No. 2,941,881.

1500 lbs. of Forged Steel Power Transmission



This 1500 lb. forged steel diesel engine connecting rod is taking a "dressing down". At working weight (1400 lbs.) it will transmit horse power in a municipal power plant. Another photographic example of the diverse sizes and weights of component parts going through our forge shops daily. You are assured of the same engineering and metallurgical quality control, the same careful craftsmanship which characterize steel forgings weighing 80 tons and more, when you place with us the responsibility for making any size forged steel component part.

Regardless of the size or weight of steel forgings or castings you require, it will pay you to consult with us.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

New Materials and Components

Numerical Control Cuts Cost of Contouring

To most continuous-path metal contouring operations, a numerical control brings simplicity of computerless punched-tape programming. The control translates slopes and arcs directly into machine motion. It bypasses the need for expensive and lengthy computer interpolation. The control incorporates the latest technology of solid-state devices. Its modular, compact design simplifies installation and maintenance. Major savings in computer time is possible by the control's ability to relieve the computer of simple, time-consuming calculations. The control also makes use of plug-in printed circuit modules. (General Electric Co.)

For more data circle No. 23 on postcard, p. 127

Adapter Measures Finish of Areas Below Surface

An adapter, for an instrument that measures surface finish, measures the surface roughness of the bottoms of holes, slots, and any area below surface level. The hole bottom adapter may be used either for hand-held or for motor-driven operation with the company's motor drive. The adapter measures surface roughness in the range from 0-250 microinches. It measures the surface in bottoms of holes as small as ⅜-in. ID, to a maximum depth of 1 in. Removal of the motor drive tang from the adapter permits measurement of bottoms of holes with a 3-in. ID, to a maximum depth of 2 in. (Brush Instruments, Div. of Clevite Corp.)

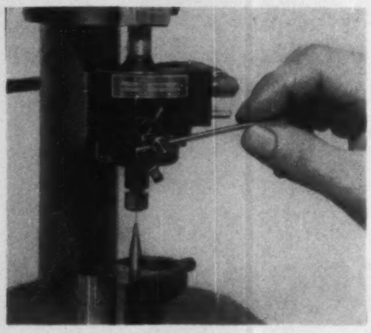
For more data circle No. 24 on postcard, p. 127

Process Produces Precision, Smooth-Edged Blanks

Cost saving, a high-speed stamping process completely eliminates shaving operations normally required to provide a smooth-edged stamped blank. The surface finish produced in the blank edge compares with that achieved by grinding. Accuracy of 0.0005 in. and closer is possible with the process. The process is carried out on either coil or strip stock with special dies; in a triple-action, high-speed hydraulic press capable of up to 120 strokes per minute. The special dies permit firm clamping of the material during the shearing sequence. (Hydro-Cam Engineering Co.)

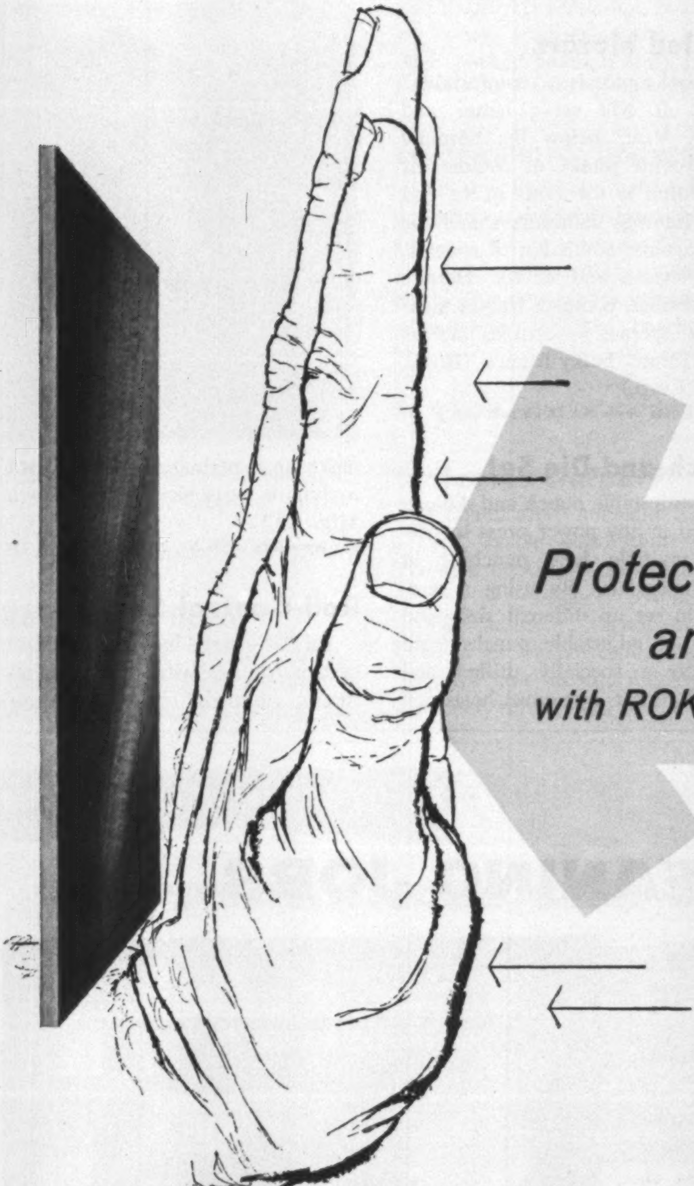
For more data circle No. 25 on postcard, p. 127

Drill Permits Accurate Drilling of Small Holes



Utilizing an air turbine motor, a miniature drill converts standard machine tools for high-precision drilling of small holes. The drill mounts in any standard drill press, jig borer, miller or lathe. The unit permits any of these machine tools to drill holes from 0.032 in. down to 0.001 in. diam. The drill has only one moving part and incorporates a ½-in. shank for mounting. Featured in the drill is a pneumatic vertical feed control, adjustable to suit the drill being used. The unit's visible feed index shows the operator at all times the position of the pneumatic down feed. (Milburn Machine Works.)

For more data circle No. 26 on postcard, p. 127



Here's the fast, economical way to protect vital parts and equipment against temperatures up to 4600°F . . . extreme abrasion . . . electrical energy . . . erosion and corrosion. Simply apply ROKIDE Ceramic Coatings — hard, crystalline refractory materials — which provide *positive* protection.

ROKIDE Coatings are supplied in rod form as "Z" Zirconium Oxide, "A" Aluminum Oxide, "C" Chrome Oxide, "ZS" Zirconium Silicate, and "MA" Magnesium Aluminate. To apply, rod is heated and the molten particles projected at high velocity against the prepared surface, where they adhere and solidify.

ROKIDE Coatings are extensively used for both military and industrial applications such as: missile components, bearing surfaces, extrusion dies, furnace and feed rolls, induction coils, igniter tips, strain gages, buffing fixtures, mechanical seal rings, pump shafts, capstan wheels, impellers, crucibles, etc.

Protect modern metals and materials

with ROKIDE Ceramic Coatings*

ROKIDE Coatings are available from a number of strategically located job shop applicators or direct from Norton Company, Worcester, Mass., and Santa Clara, California. Find out how they can cut *your* maintenance and production costs. NORTON COMPANY, 207 New Bond Street, Worcester 6, Massachusetts.

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Write for full details on the ROKIDE Coating Process.

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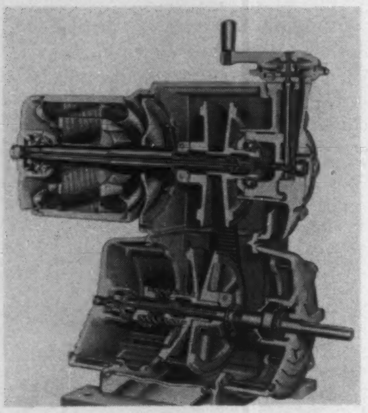
Mechanical Drive



An adjustable-speed ac drive provides infinitely variable speeds over a wide range through the mechanical interaction of adjustable discs and a ribbed belt. Speeds as low as 1 rpm and as high as 10,000 rpm are available by a combination of the drive with an integral gear head. The drive can be supplied with a drip-proof, totally enclosed or explosion-proof motor. Electrical modifications are available for special needs. (The Louis Allis Co.)

For more data circle No. 27 on postcard, p. 127

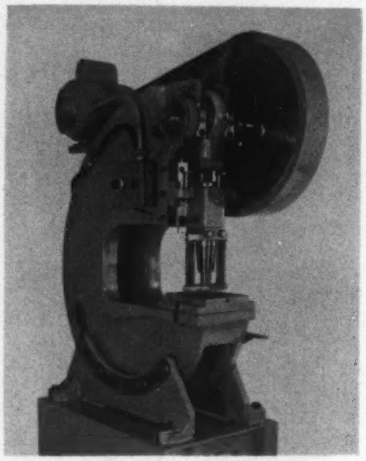
Cooled Motors

A cool motor is a "comfortable" motor. It will serve better and longer. Vents below the terminal box provide intake of cooling air in addition to the vents in the end bells. Internal deflectors shield the vents against admission of rodents, large vermin and debris. Despite their smaller, compact frames these motors operate as cool as motors in the former bulky frames. (Brook Motor Corp.)

For more data circle No. 28 on postcard, p. 127

Punch-and-Die Set

An adjustable punch and die can be used in any power press to perform multiple hole punching in sheet materials. By using a template to set up different sizes and shapes of adjustable punches and dies on a specially drilled and tapped die set, numerous holes can be punched in one operation. This cuts the time needed to drill or punch each hole separately or to make up a permanent die set. All tooling is reusable. (O'Neil-Irwin Mfg. Co.)



For more data circle No. 29 on postcard, p. 127

Roll-Control System

An air-over-hydraulic control system for use with the manufacturer's industrial brakes controls

EXECUTIVE REPORT #19

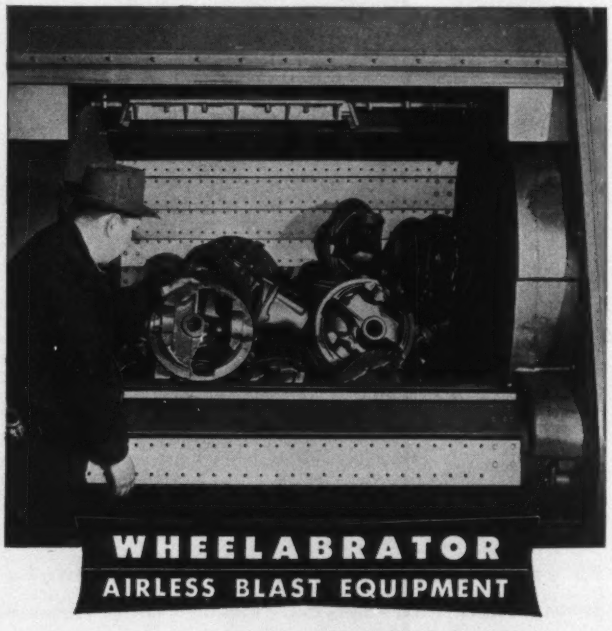
TOUGH CLEANING JOBS

call for the mighty SUPER TUMBLAST

With tireless cleaning power and super performance features, the Wheelabrator Super Tumblast gives you the ultimate in cleaning efficiency and production capacity. It's engineered throughout as a *heavy duty* batch type airless blast mill, to handle the rough and tough cleaning jobs, clean efficiently, save abrasive, give maximum parts wear, and go easy on maintenance costs.

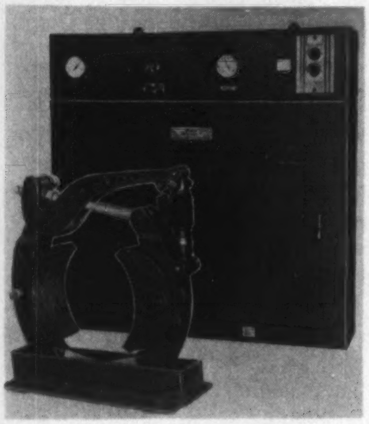
Super Tumblast performance is proven in nearly 200 successful installations

The Super Tumblast has demonstrated its ability to handle the really tough cleaning jobs, deliver high production, superior cleaning results, exceptional labor savings and unequalled economy. Get all the facts from Wheelabrator Corporation, 510 S. Byrkit St., Mishawaka, Ind. In Canada, P.O. Box 490, Scarborough, Ont.



WHEELABRATOR
AIRLESS BLAST EQUIPMENT

inrunning rolls. As a safety device, it can also be applied to other types of production equipment to provide damage-control stops, stops to minimize product damage and automatic rapid-production stops. (Wagner Electric Corp.)



For more data circle No. 30 on postcard, p. 127

Rolling Oil Base

Reduction of power requirements, cleaner strip and elimination of cleaning prior to annealing are all claimed for a rolling oil base. It conditions the steel surface, increases corrosion protection and is said to prevent scratching and scuffing when applied at the pickler oiler. (Baker/Gubbins Co.)

For more data circle No. 31 on postcard, p. 127

Hydraulic Cylinders

All-steel hydraulic cylinders, for operation at 3000 psi, come in bore sizes of 1⅛ in. through 12 in. in all standard mounting styles. A clevis mounted model incorporates self-aligning spherical bearings at both pin connections. (Pathon Mfg. Co.)

For more data circle No. 32 on postcard, p. 127

Indicates Outputs

A digital servo indicator features a 3-in. synchronized chart drive. The unit provides a permanent recording of transducer outputs and a high accuracy, digital readout. Used in jet engine testing, the unit indicates and records quickly and accurately thrust, fluid flow, weights, temperatures, or rpm's which can be converted into ac or dc millivolts. (Gilmore Industries, Inc.)

For more data circle No. 33 on postcard, p. 127

Threading Tool

For use in maintenance and machine shops, a threading tool cuts eighteen different thread sizes from ⅛-½ in. in U.S.S. and S.A.E.; plus ⅛- and ¼-in. pipe threads. The dies are permanently mounted in three tools (six dies in each) and are always ready for use. The face of each die is parallel with the back of the holder, making it simple for any user to cut threads on any lathe, pipe machine, drill press or by hand. (Mohr Tool & Mfg. Co.)

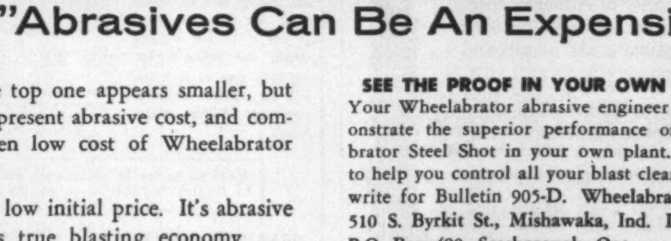
For more data circle No. 34 on postcard, p. 127

Tap and Die Holder

A 6-in-1 tool combination is a tap holder, an acorn die holder, and a button die holder, for right and left hand threading and tapping. It features on efficient releasing mechanism, and can easily be changed for either right or left hand thread-

EXECUTIVE REPORT #24

APPEARANCES CAN BE DECEIVING



"Low-Price" Abrasives Can Be An Expensive Bargain

Measure the bars. The top one appears smaller, but it's not. Measure your present abrasive cost, and compare it with the proven low cost of Wheelabrator Steel Shot.

Don't be deceived by a low initial price. It's abrasive performance that gives true blasting economy . . . the lower abrasive consumption, faster cleaning, and lower maintenance enjoyed by users of Wheelabrator Steel Shot. Try it, and take a true measure of blast cleaning economy.

SEE THE PROOF IN YOUR OWN PLANT

Your Wheelabrator abrasive engineer will demonstrate the superior performance of Wheelabrator Steel Shot in your own plant. For data to help you control all your blast cleaning costs, write for Bulletin 905-D. Wheelabrator Corp., 510 S. Byrkit St., Mishawaka, Ind. In Canada, P.O. Box 490, Scarborough, Ont.

WHEELABRATOR
STEEL ABRASIVES

ing and tapping. There are no spring plungers to wear or break; no small screws to work loose. (R & L Tools.)

For more data circle No. 35 on postcard, p. 127

Drafting Tables

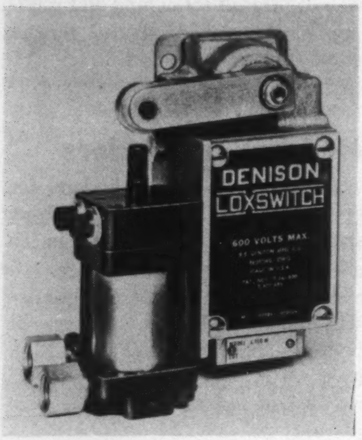
A completely new four-post model, incorporates the beauty of "Sahara-Tan" finish with the modern styling of canted-leg design. Stability is maintained by using only front and back cross rails. Less structural members simplify floor maintenance. (Hamilton Mfg. Co.)

For more data circle No. 36 on postcard, p. 127

Air-Operated Actuator

Development of an air-actuated unit permits remote control operation of heavy-duty limit switches. This also permits the mounting of a limit switch where maximum protection can be provided against moisture, dirt, vibration, and heat, as well as at locations which will facilitate wiring and maintenance. The new device requires no air valve or air switch. Thus it permits actuation in formerly inaccessible places. (The R. B. Denison Mfg. Co.)

For more data circle No. 37 on postcard, p. 127



Lubrication System

Fully automatic, a lubricating system continuously circulates clean, filtered lubricant through machine bearings at controlled rates. The system provides machine builders with a dependable means of centralized automatic lubrication. Lubricant is pumped to bearings through the system, and returned by tubing or piping. (Bijur Lubricating Corp.)

For more data circle No. 38 on postcard, p. 127

Hand Valve

Positive shutoff and freedom from galling are the features of a "floating cone" ¼-in. hand valve. It is recommended for liquid or gas service on meter manifolds, seal chambers, hydraulic equipment and similar applications. The valve is supplied in five variations of globe and angle types, accommodating line pressures up to 3000 psi. (The Foxboro Co.)

For more data circle No. 39 on postcard, p. 127

Counting Device

An automatic counting device insures accurate count on any type of equipment controlled by pneumatic or hydraulic action. The counters screw into the line controlling the air cylinder. They can be com-

stop corrosion with...
Adheron*
epoxy finishes

Spray, brush or roll Adheron on wood, steel or masonry surfaces for a tough, flexible, chemical and acid resistant coating.

Hundreds of industrial users are proving the superiority of Adheron epoxy maintenance finishes. You get positive protection against acids, alkalis and corrosive fumes.

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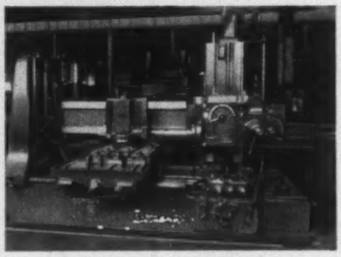
plus MACHINE SHOP with Modern Equipment equals Precision Work!

Our modern Machine Shop is equipped to machine castings we produce as well as custom machining of steel castings, weldments and fabrications.

We have Vertical Boring Mills to accommodate castings up to 16 feet in diameter and 10 feet 5½ inches high. Our Open Side Planer has a 17 foot six-inch stroke. Our horizontal Boring Mills have up to a six-inch bar, 12 foot horizontal travel and 101-inch vertical travel.



Close-up of 5" spindle horizontal boring mill shows castings being faced by cutter.

Our spacious Machine Shop is also equipped with numerous drill presses, lathes and millers.
YOUR INQUIRY IS MOST WELCOME.
Write or Phone Kutztown, OVerbrook 3-7351.

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KUTZTOWN 45, PENNSYLVANIA

pletely installed in five minutes. There is no linkage to assemble or get out of adjustment, no solenoid, and no possibility of half or miscounts. (Pneumaticount, Inc.)

For more data circle No. 40 on postcard, p. 127

Small Tapper

Designed for use with small drill units or drill presses, a small tapper handles taps up to 10-32 in steel. Tapping torque is controlled by the operator's finger pressure on the drill-press handle. The operator can "feel" the tap through the work. (Commander Mfg. Co.)

For more data circle No. 41 on postcard, p. 127

Inspection System

A new concept of two-dimensional inspection centers on a compact, solid-state unit which reads out hole-center locations in two axes simultaneously. Accuracy is 0.001-in. This unit is capable of checking complex workpieces up to ten times faster than conventional inspection equipment. (The Bendix Corp.)

FERRANTI
Bendix

For more data circle No. 42 on postcard, p. 127

Pin-type Bearings

Machine builders, whose equipment is designed with double cup bearings in floating positions, requiring loose cup fits, can use a pin-type double cup bearing. Designed to be dimensionally interchangeable with conventional company double cup bearings, the new pin-type bearing will enable machine builders to use these new bearings with minimum changes to existing designs. The bearing offers distinct

NEW...

PYRO-EYE*

Two-Color Optical Pyrometer

provides

fully automatic temperature measurement, recording and control in the ranges from 750°C to 2500°C and 1400°F to 4500°F.

Pyro-Eye is designed for in-plant and laboratory temperature measurement of incandescent molten metal, glass, ceramics, billets, rods, sheets, refractories and many other high temperature applications.

Continuous, automatic measurement and control of high temperatures is now possible because Pyro-Eye provides a high degree of repeatability and accuracy.

Pyro-Eye is accurate because it is relatively unaffected by unknown or variable emissivity. It measures temperature as a function of spectral characteristics . . . not as a function of total radiation.

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ALLEN

The cost of ALLEN Hex-Socket Cap Screws is only a minor fraction of your assembly costs . . . be sure you're getting the timesaving, cost-saving advantages of genuine Allens!

Ever since Allen first produced the hex socket head screw nearly fifty years ago, specifying *genuine* Allens (made by Allen of Hartford) has been a sure way to guarantee dependable threaded fastening.

Only *genuine* Allens have Leader Points that make starting easier, and greatly minimize danger of cross threading. *Genuine* Allens are "pressurformd" to preserve the long fibers uncut throughout the length of the screw, giving stronger sockets for greater tightening torque.

Write for samples and engineering data. See how *genuine* Allens will make your product better.

ALLEN HEX-SOCKET SCREWS HEAD

Allen's new 1960 Series Socket Head Cap Screws give up to 2⅓ times more load carrying capacity, without indentation. Head diameter of sizes from ¼" up is now uniformly 1½ times the body diameter—providing more under-the-head bearing surface, and a proportionate increase in clamping force. Write for new Bulletin G-25, with full specifications.

Stocked and sold by leading Industrial Distributors everywhere

50 ANNIVERSARY YEAR ALLEN HEAD 1910-1960

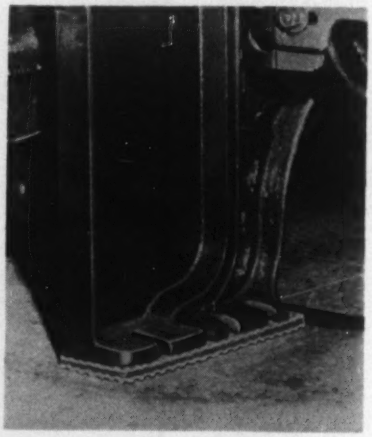
ALLEN MANUFACTURING COMPANY
HARTFORD 1, CONNECTICUT, U.S.A.

advantages to machine builders in bearing applications where there is an inherent tendency for the outer race or cup to creep or turn in the housing. (The Timken Roller Bearing Co.)

For more data circle No. 43 on postcard, p. 127

Anti-Vibration Pads

Highly efficient anti-vibration material—placed under the base or feet of machines—prevents the transmission of vibration and/or noise to surrounding areas. Actual service conditions prove this material eliminates up to 90 pct of a machine's vibration. No lagging or cementing to the floor is necessary. (Lowell Industries, Inc.)



For more data circle No. 44 on postcard, p. 127

Ceramic Parts

Ceramic parts, including bushings, washers, rods, disks, plates and V-blocks, can be used at temperatures to 2100°F. This line of stock ceramic components meets the demands of design and production engineers for off-the-shelf components, for use in both equipment and tooling. (Duramic Products, Inc.)

For more data circle No. 45 on postcard, p. 127

Elapsed-Time Indicator

Featuring digital readout, a subminiature elapsed-time indicator weighs just 3¾ oz, measures 1-1/16 in. OD x 2¾ in. maximum. It operates at 360-440 cycles per second with a 2½-w maximum power input. The digital presentation runs to 9999 hours and the numerals are 5/32-in. high. Other important features include jewel bearings, an ultra-precision gear train with a 1.8 million to 1 ratio, and a very low inertia motor. The indicator was designed to be light and small enough to accompany "black boxes" of critical equipment anywhere. It provides a continuous and easy-to-read record of operational use and life which is applicable for reliability programs and life testing, design and systems analysis, and utilization studies. (Waltham Precision Instrument Co.)

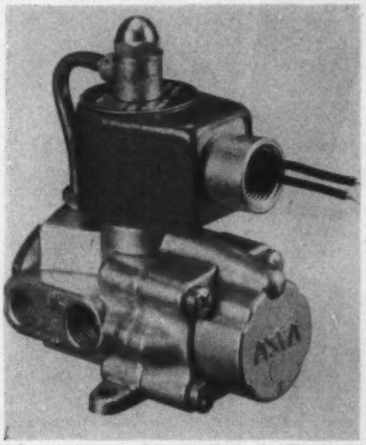
For more data circle No. 46 on postcard, p. 127

Locking Dowels

Locking dowels and bushings, installed in pattern plates and the cope and drag walls of the company's foundry flasks, prevent flask walls from "spreading" when under heavy squeeze pressure. These dowel assemblies, eight to the average size flask, "lock" flask walls to the pattern plate to prevent flask deformation. When the pattern plate is removed, cope and drag walls "lock" together, so they open as a unit when corners are "popped-open"—eliminating strain on flask pins and bushings. Assemblies can be used with ⅜-, 7/16- and ½-in. pattern match plates. They are made in two sizes, for flasks with 1- to 1¼-in. flanges, and 1½- to 2-in. flanges. (Hines Flask Co.)

For more data circle No. 47 on postcard, p. 127

Solenoid Valve



A single-solenoid, two-position four-way solenoid valve has a forged-brass body—available in ¼ or ⅜-in. pipe connections—and poppet-type seats and discs. The main valve discs are power driven in both directions—without the aid of return springs. Practically instantaneous in operation, the valve will operate on air, water or hydraulic oil at pressures up to 250 psi and at heats to 212°F. (Automatic Switch Co.)

For more data circle No. 48 on postcard, p. 127

Offset Boring Heads

Precision offset boring heads bore deep or shallow, with one standard length boring bar. They are interchangeable for use on jig borers, boring mills or turret lathes. One of the most appealing features about the new heads is that plants can operate with a reduced inventory, and less replacement of parts because one shank is adjustable to boring at various depths. The number designated on the direct-reading dial will increase the bore diameter the same amount. (Everede Tool Co.)

For more data circle No. 49 on postcard, p. 127

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All-State provides the right alloy, right finish, right flux, and the right service so you can join any commercial metal to any other—on production line or in maintenance.

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This answer may be as near as the nearest of over 1000 All-State distributors here and abroad. Or just write or phone (WHite Plains 8-4646) our Technical Department and Laboratories, White Plains, N. Y. A few minutes and a few pennies might save you thousands of dollars.

To help you know the line and select the alloy and flux best suited for each job, All-State publishes a 56-page INSTRUCTION MANUAL, free to interested users. Also, a special ALUMINUM MANUAL containing 36 pages of data on aluminum alloys and how to join them. If you work with aluminum, ask for a copy.

To serve you, All-State maintains 3 factories, 4 warehouses (White Plains, N. Y.—St. Louis, Missouri—South Gate, California—Toronto, Ontario, Canada) and a central Technical Department and Laboratory at headquarters.

All-State ALL-STATE WELDING
ALLOYS CO., INC.
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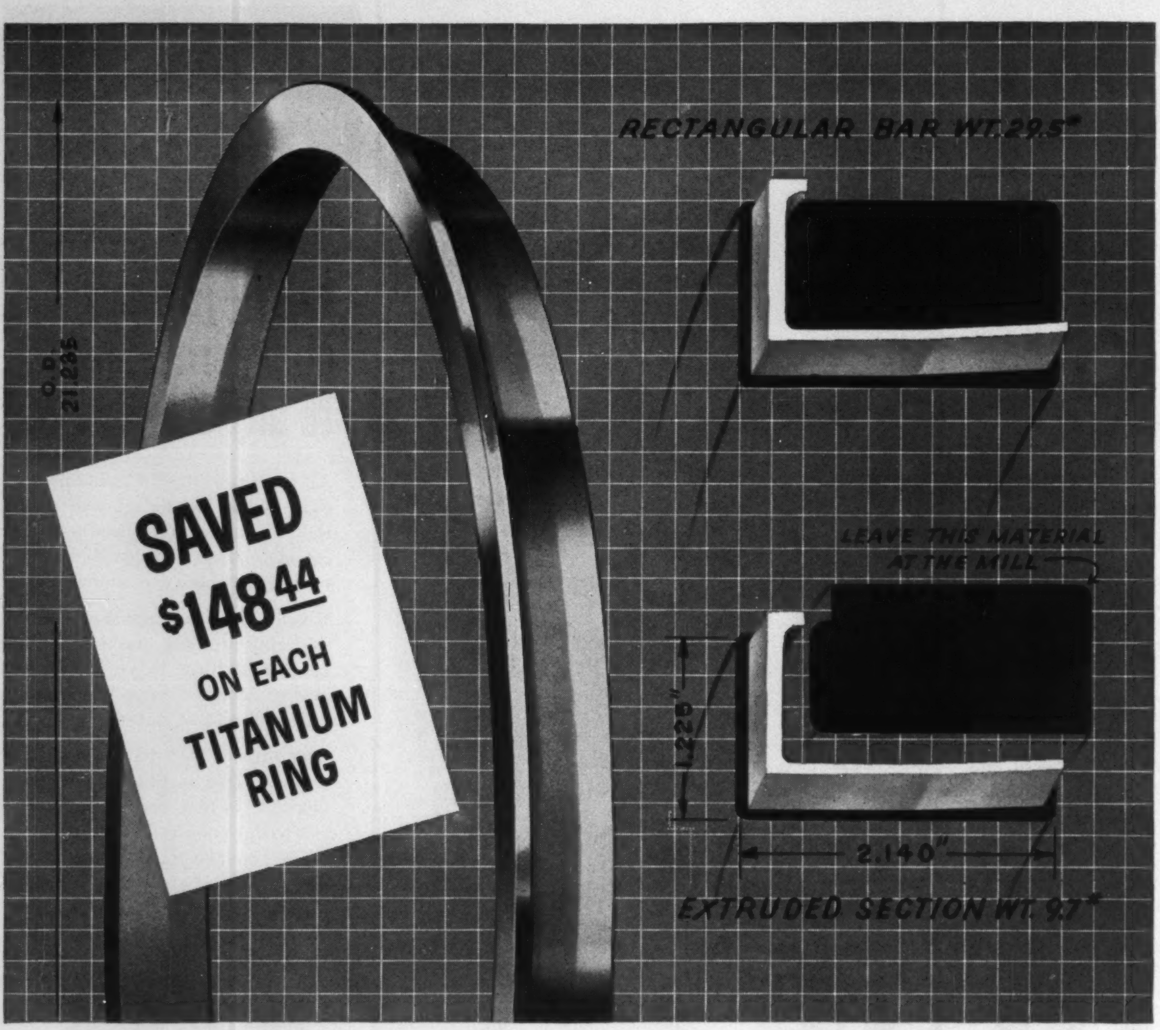
RECTANGULAR BAR WT. 29.5#
O.D. 21.235
SAVED $148.44 ON EACH TITANIUM RING
LEAVE THIS MATERIAL AT THE MILL
1.220"
2.140"
EXTRUDED SECTION WT. 9.7#

Extruded section reduces material required 65% on this flash butt-welded missile part

By leaving 2/3 of the titanium required at the mill, dramatic savings were effected on this ram jet engine part used in the Bomarc.

Amweld quoted the job, suggesting a special extruded section shown here, and saved 19.8 lbs. of expensive titanium per ring. The flash butt-welded rings from extruded sections offered additional savings in machining time, since only a small amount of metal had to be removed.

Amweld is equipped to supply flash butt-welded rings and circular products in stainless, titanium, aluminum, as well as a wide variety of corrosion-resistant alloys. If you would like to know more about Amweld's welding, fabricating and machining facilities, phone or write.

GET THE FACTS ABOUT AMWELD

New 20-page catalog describes flash butt-welded rings and circular products manufactured by Amweld. Also booklet entitled, "How Flash Butt-Welded Rings are Made."

AMWELD® INDUSTRIAL PRODUCTS

THE AMERICAN WELDING & MFG. CO. • 120 DIETZ ROAD • WARREN, OHIO

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Glass Fiber

Technical data on properties of glass fiber are a feature of a bulletin. Descriptions of the product show performance data. Applications of fiber glass are listed, particularly for use as package cushioning and for vibration damping. (Fibrous Glass Products, Inc.)

For free copy circle No. 1 on postcard

Barrel-Finishing Units

A catalog sheet describes a line of barrel-tumbling equipment for finishing and defining plastic and metal parts by the dry process. (Tumb-L-Matic, Inc.)

For free copy circle No. 2 on postcard

Thermocouples

A catalog outlines a line of hard-packed, small-diameter, mineral-insulated thermocouples. The catalog contains specifications, ordering information and prices on bulk material, elements and complete assemblies. (Mineapolis - Honeywell Regulator Co.)

For free copy circle No. 3 on postcard

Variable-Speed Drives

A 16-page, two-color catalog of stepless variable-speed drives, for fractional horsepower applications, lists and pictures typical applications. (Zero-Max Co.)

For free copy circle No. 4 on postcard

Heat Detector Cells

Concise descriptions and detailed specifications of thermistor heat detector cells are contained in a technical bulletin. The bulletin describes infrared detectors for detecting temperature variations in a broad range of operations that are too fast, inaccessible, hot, or rigid in specificaions for direct contact with the target. (Servo Corp. of America)

For free copy circle No. 5 on postcard

Roller Conveyor

Principles of adjustable pressure conveyor operation, and their application to live roller conveyors, are explained in a four-page bulletin, and illustrated by picture and photo-diagram. Information contained in the four-page bulletin covers types of materials, cartons and other containers for which the new conveyor is especially suited. (The Rapids-Standard Co., Inc.)

For free copy circle No. 6 on postcard

Elevator Furnaces

Electric elevator furnaces for stress relieving and annealing are described in a four-page bulletin. Cutaway drawing of furnace shows construction features. A chart gives furnace characteristics. (General Electric Co.)

For free copy circle No. 7 on postcard

Force Gages

A complete line of mechanical force gages is described in detail in a bulletin. The brochure gives complete specifications and prices for each of the company's twenty-one precision, direct-reading gages. The gages can be used for measuring both tension and compression loads in ranges of from 0-500 grams up to a maximum of 0-500 lb. (Hunter Spring Co.)

For free copy circle No. 8 on postcard

Carbide Compositions

More than seventy-five proven uses of cemented hard-carbide compositions and titanium-base carbides are illustrated in a 24-page booklet. The booklet includes records of wear resistance up to 100 times that of steel, high resistance to impact, deformation, corrosion,

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FREE LITERATURE

and oxidation at temperatures of 2200°F and above. (Kennametal Inc.)

For free copy circle No. 9 on postcard

Presses

Generously illustrated, a 24-page catalog describes mechanical and hydraulic presses and press brakes; hydraulic shears, press and press-brake tooling, and special machinery. (Verson Allsteel Press Co.)

For free copy circle No. 10 on postcard

Resists Relaxation

Well illustrated, a bulletin contains tables and figures to demonstrate the properties of grain-coarsened Inconel for high-temperature applications. The Inconel improves the resistance to relaxation at high temperatures. (Tech-alloy Co., Inc.)

For free copy circle No. 11 on postcard

Electrical Operator

A booklet tells how to apply electrical operators, for the remote control of circuit breakers. (Westinghouse Electric Corp.)

For free copy circle No. 12 on postcard

Gears, Speed Reducers

Fully illustrated, a catalog contains complete information on sizes, ratings and specifications of the company's complete line of gears and speed reducers. Also contained are easy-to-understand engineering data on the proper selection of gears and reducers to meet specific job requirements. (For free copy write on company letterhead to Ohio Gear Co., 1333 E. 179th St., Cleveland 10)

For free copy circle No. 13 on postcard

Hex and Hex Screws

A brochure gives dimensional data, photographs, and drawings on hex and hex screws, carriage bolts, and lag screws. (Standard Screw Co.)

For free copy circle No. 14 on postcard

Electrical Oils

Complete technical information, on electrical insulating oils for transformers and cables, is given in a six-page bulletin. The bulletin discusses the functions of a transformer oil; gassing characteristics of oils; properties of electrical oils; uses for inhibited and uninhibited oils; and typical properties of each type. Information on cable oils includes a discussion of the oil requirements of the three basic types of cables. (Sun Oil Co.)

For free copy circle No. 15 on postcard

Water-Tube Boilers

Packaged water-tube boilers is the subject matter of a four-page bulletin. The boilers are for applications requiring high-pressure steam. The bulletin illustrates pictorially the boilers' numerous engineering features. (Cleaver-Brooks Co.)

For free copy circle No. 16 on postcard

Ultra-Pure Gold

Describing 99.999-pct pure gold, for semiconductor and other applications, a technical bulletin also lists the physical properties. (High Purity Metals, Inc.)

For free copy circle No. 17 on postcard

Plastics Products

Liberally illustrated, an eight-page catalog covers a line of plastics products. They are designed for a wide range of industrial applications. The bulletin presents concise data on the physical, mechanical and electrical properties. Text is supplemented by photos showing 35 typical product applications. (Hooker Chemical Corp., Durez Plastics Div.)

For free copy circle No. 18 on postcard

Rotary Tables

An illustrated data sheet describes hand-revolving tables for use with horizontal boring mills and milling planers. Tables will index extra-heavy loads even when placed off center. (The Cincinnati Gilbert Machine Tool Co.)

For free copy circle No. 19 on postcard

Fuel-Oil Conditioner

The subject of a brochure is a multi-purpose liquid fuel-oil conditioner. A list of the common faults encountered in buying "off the shelf" fuel treatments and how to avoid same is given. (Polyphase Chemical Service, Inc.)

For free copy circle No. 20 on postcard

Furnace Apparatus

Furnace apparatus, for semiconductor preparation and growing of single crystal materials, is dealt with on a specification sheet. (Marshall Products Co.)

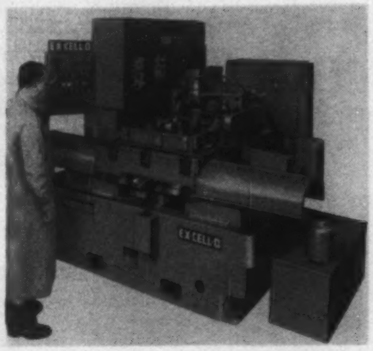
For free copy circle No. 21 on postcard

New Equipment and Machinery

Machine Operates from Any Control System

Highly versatile, a numerically-controlled machine converts from a template grinder to a boring and turning machine. It accomplishes this through the use of interchangeable heads. This two- or three-dimensional tape-controlled machine boasts a heavy, highly-rigid bed; hand-scraped anti-friction ways; lead screws with recirculating ball-type anti-friction screw and nut assemblies; preloaded ball thrust bearing supports on each end. Only 5½-lb direct pressure overcomes initial inertia of the cross slide, though it weighs nearly 1000 lb. The machine can operate from any high-performance numerical-control system. (Ex-Cell-O Corp.)

For more data circle No. 60 on postcard, p. 127



Lathe Features Continuous-Path Tape Control

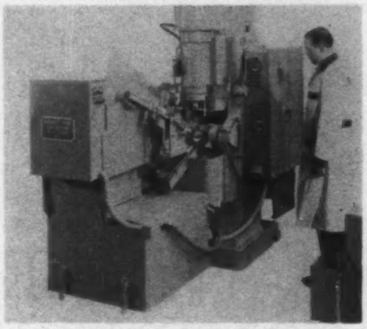
Tape controlled, a turret lathe can machine intricate contour and step work on some really difficult parts. Combined with a modestly-priced tape recorder, a turret-lathe operator will be able to make his own tapes after less than one day's instruction. With fast, simple tape preparation, the lathe cuts lead time requirements on short-run work. Inventory can also be reduced. Design changes can be quickly incorporated. Dramatic savings in time and tooling, plus elimination of human error and extreme, repeat accuracy on complex work can be expected. (Gisholt Machine Co.)

For more data circle No. 61 on postcard, p. 127

Unit Machines Entire Ball Surface at Same Speed

The advisability of removing excess stock before microhoning truncated spherical surfaces, brought about the development of a machining unit. For example, in processing a 1¼-in. ball stud, this single-spindle machine removes 0.068 in. of stock from the forging. This forging is previously heat treated to 30-34 Rockwell "C". A 60-80 microinch finish is generated in a 15-second cycle. This results in a part within 0.0005 in. for true sphericity, and 0.001 in. for size. This method is applicable as long as there is some means of locating the piece without touching the spherical surface. (Micromatic Hone Corp.)

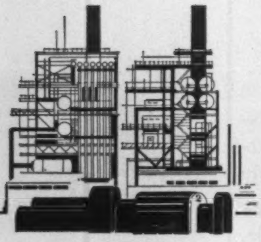
For more data circle No. 62 on postcard, p. 127



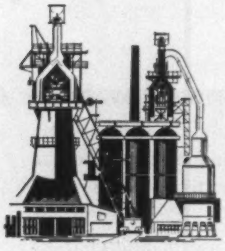
Ultrasonic Machine Tool Has Solid Tool Design

An ultrasonic machine tool has an effective machining area ranging from 1/64-½ in. and an additional capacity to 1 in. for shallow machining. Vertical tool adjustment is 2 in. The machine features an indicating light that constantly monitors cutting conditions for the operator; also, a tuning device that automatically senses and compensates for tool wear. The tool is radially adjustable through 360°. In ultrasonic machining, a cutting tool reciprocates about 20,000 times per second against a liquid abrasive grit. The grit bombards the workpiece and chisels away very fine particles to produce the desired shape. (The Sheffield Corp.)

For more data circle No. 63 on postcard, p. 127

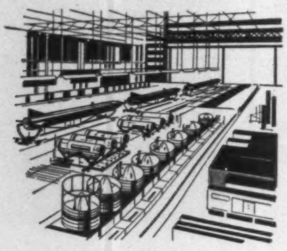


ELECTRIC POWER

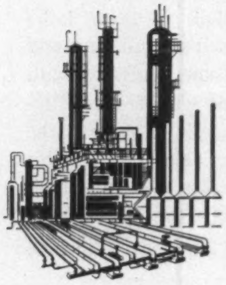


STEELMAKING

RW-300



MISSILE AND AIRCRAFT



OIL REFINING AND CHEMICAL

MANY "LEADERS" IN DIGITAL COMPUTERS, BUT ONLY ONE LEADER IN DIGITAL CONTROL COMPUTERS

THE THOMPSON-RAMO-WOOLDRIDGE PRODUCTS COMPANY

a division of ***Thompson Ramo Wooldridge Inc.***

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80% OF ALL DIGITAL CONTROL COMPUTERS NOW OPERATING IN INDUSTRY ARE RW-300 SYSTEMS

There are many companies which make various kinds of digital computers. These electronic machines serve useful purposes, ranging from the handling of payrolls to the solving of abstract mathematical problems, but they are not intended to *control* industrial processes. They are not designed to be connected directly to processes or test loops.

[redacted]

The Thompson-Ramo-Wooldridge RW-300 Digital Control Computer is built specifically for that purpose—to operate continuously a diversity of production processes in such industries as electric power, primary metals, missile and aircraft, electronics, chemicals, petroleum refining, pipelines, cement, and nuclear.

The RW-300 leads the field with 18 installations which have logged a total of 145,000 hours of operation—more than 16 years. It provides reliability exceeding 99% in around-the-clock applications. That is why you will see RW-300 systems in 80% of all industrial installations employing digital control computers.

For further information on the RW-300 and the associated engineering services, call or write Mr. Raymond E. Jacobson, Director of Marketing, Dept. IA-1218-1.

RW-300 computer controlling ammonia production at Monsanto Chemical Company plant, Luling, Louisiana.

TRW

NEW EQUIPMENT

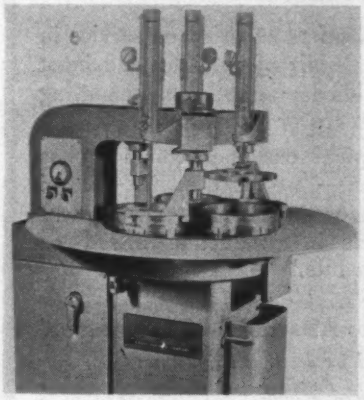
Gear Hobber

The Koepfer gear hobber is a fully automatic production machine with magazine feeding. Labor is limited to loading the magazine and checking finished workpieces. The machine performs equally well in conventional or climb-hobbing. It is also equipped with production-program controls. (Cosa Corp.)

For more data circle No. 64 on postcard, p. 127

Lapping Machine

Completely redesigned, a versatile lapping machine features a new abrasive-distribution system. This system maintains the correct mixture of compound to vehicle—from initial filling to last drop. It provides adjustable flow control. And, through pressure pumping at a constant head, insures a uniform deposit at the lapping stations. Pump and tank are mounted on the inside of a door in the machine base. Pneumatic lifts are incorporated as standard equipment. They speed up loading and unloading of small- and medium-size parts. The lifts also simplify raising and lowering of conditioning rings and/or pressure plates. A single hand-wheel permits easy adjustment of conditioning rings to compensate for normal wear patterns in the lapping plate. (Crane Packaging Co.)



For more data circle No. 65 on postcard, p. 127

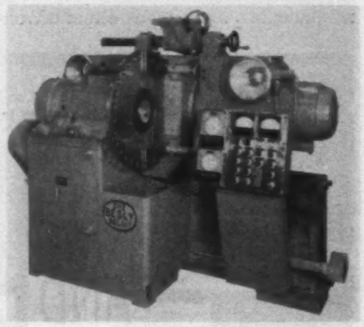
Stencil Ink

Stencil inks are widely used for all shipping-room stenciling, color coding, inspection and other marking. The inks dry instantly and are waterproof. (Reynolds Ink, Inc.)

For more data circle No. 66 on postcard, p. 127

Disc-Grinding Machine

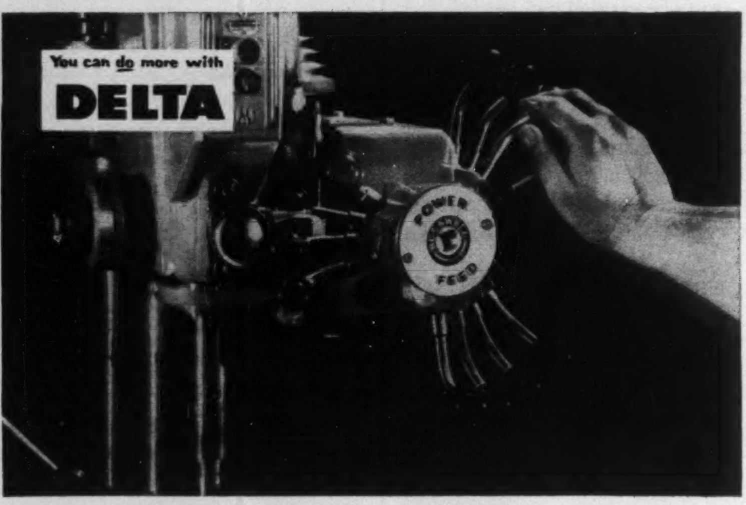
A production disc-grinding machine ideally suited for all types of double spindle grinding jobs, features automatic sizing, loading and unloading. It is particularly suited to thru-feed grinding. It also suits operations that require clamping of parts to insure grinding surfaces square to a mating surface. (Besly-Welles Corp.)



For more data circle No. 67 on postcard, p. 127

Tests Metal Specimens

For friction and wear testing of metal specimens, a tester can be used for simulation of most types or combinations of wear, heat and atmospheric conditions; for evaluation of ring and cylinder wall wear, bearing wear and friction, and determining wear characteristics of all types of metals and alloys. It can also be used for the friction measurement of solid lubricants, plastics



New concept in power feeds

Rockwell announces a new line of Delta 20" Power Feed Drill Presses with a totally different concept: fitting the mechanical control movements of the machine to the natural, easy motion of the operator's hand. This makes possible a simple, low cost method of increasing productivity and improving drilling quality.

Such an advanced development in mechanical power feeds offers advantages *never before available* on a standard drill press—up front control for effortless one hand operation; infinitely adjustable drill point pressure; and a built-in feature for remote control or interlocking with automation devices. Write for free brochure on floor, bench, overhead and multiple-spindle models. Rockwell Manufacturing Company, Delta Power Tool Division, 640H N. Lexington Ave., Pittsburgh 8, Pa.

REPAIR DAMAGED
VACUUM MELTING CRUCIBLES

SAVE
TIME
AND
MONEY

Zak offers experienced service in the repair of crucibles and ingot molds damaged through handling mishaps or other causes.

Typical customer comment has been—"we saved money—down time was cut — our crucible was back in production ahead of schedule."

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Send for descriptive literature:
BU-58 Button Furnace • Cr-58 Crucible • FAC-58 Facilities Folder • IM-59 Ingot Molds • HT-59 Hot Topping Unit

Manufacturers and Fabricators of:
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- VACUUM or CONTROLLED ATMOSPHERE CHAMBERS
- SKULL MOLDS
- VACUUM CRUCIBLES
- HOT TOPPING UNITS
- INGOT MOLDS (STEEL AND COPPER)

FOR RESEARCH OR PRODUCTION

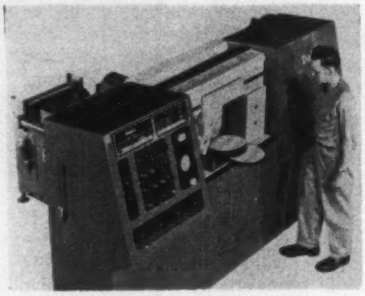
"Engineering Manufacturers for Industry"
ZAK MACHINE WORKS, INC.
TROY (GREEN ISLAND) NEW YORK

and fibrous materials as well as oils and greases. (Hohman Plating & Mfg., Inc.)

For more data circle No. 68 on postcard, p. 127

Power Cut-Off Saw

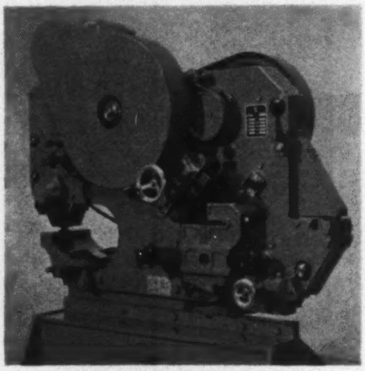
A new type of power cut-off saw employs four super-saw bands and a revolutionary super-drill. Designed for continuous, high-production operation, it will cut two to three times faster than present power saws. It has a capacity of 16 x 20 in., indexes automatically from 0 to 24 in. in thousandths and leaves a stub end of only 2½ in. With manual indexing this is reduced to 1 in. (The DoALL Co.)



For more data circle No. 69 on postcard, p. 127

Shear Tool

"Universal Steel Workers," made in five sizes, are very popular with structural steel and ornamental iron shops. They serve in many shops which handle steel plate, angles, tees, squares and rounds. Outstanding features include the new universal die block. This block eliminates the changing of dies. The shear end has a two-spindle "hold down" which permits rapid adjustment for

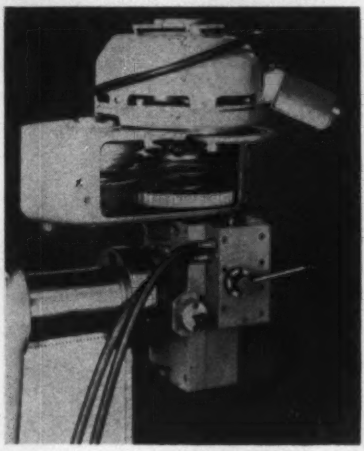


various plate thicknesses. Naturally, this is an improvement over the common mushroom type. Regarding the profile knives, the new design permits rapid changeover time. The knives can also be removed for cleaning. (Upton Bradeen & James Ltd.)

For more data circle No. 70 on postcard, p. 127

Vertical Mill

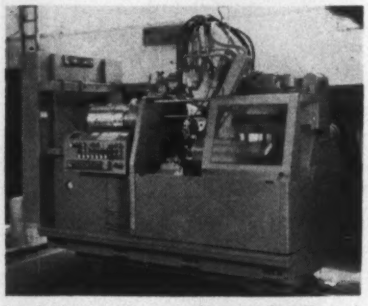
Easier, smoother manual operation is reported for the quill feed of this vertical milling machine. A new quick-release mechanism completely frees the manual control from any hydraulic back-pressure. The quill feed has both a manual lever and a fine-feed handwheel. The hydraulic feed is infinitely variable from 0 to 25 ipm. (South Bend Lathe, Inc.)



For more data circle No. 71 on postcard, p. 127

Single-Spindle Lathes

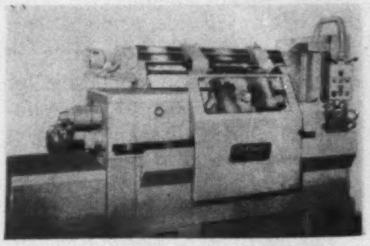
Moving on to other high-production machines, a manufacturer will have in operation three different variations of an all-new family of single-spindle automatic-turning and tracing lathes. The basic machine is a bridge-bed design for maximum rigidity. This design increases versatility of tool motion. It also eases loading and unloading—manual or automatic. And it provides ideal conditions for chip removal. (Jones & Lamson Machine Co.)



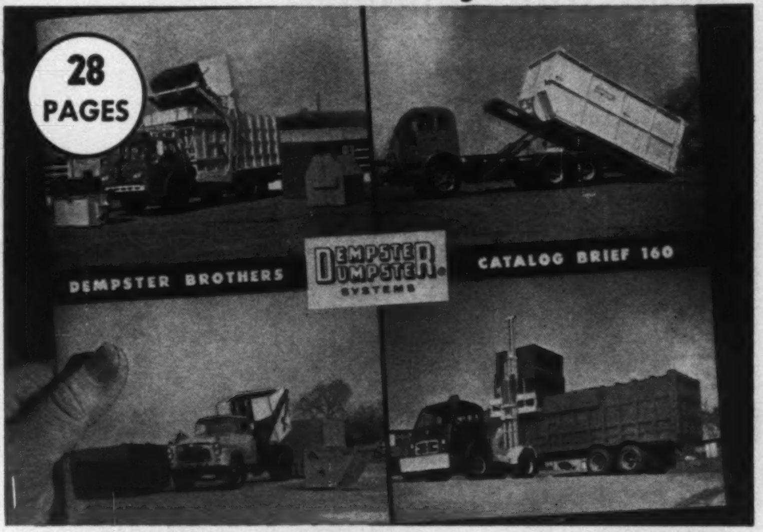
For more data circle No. 72 on postcard, p. 127

Automatic Copying

Several models of multi-cycle automatic-copying lathes are built and marketed in the U. S. under rights granted by H. Ernault-Batignolles of France. Versatile design of these lathes provides production individuality. One of note is the ability to completely "copy turn" a part, in-



New Catalog Describes Latest Developments in Waste and Refuse Storage and Removal



New Techniques Cut Cubic Yard Removal Costs to Record Low

This new 28-page color catalog describes remarkable new developments in waste control and disposal that have, within the last two years, obsoleted many systems now in use. Cubic yard handling costs have been reduced to a point where many firms and municipalities are saving thousands of dollars annually that they were previously spending to operate old-style equipment.

Materials handling and waste disposal are two of the few areas of large potential cost reduction remaining in manufacturing and municipal administration. This new catalog has a bearing on both of these areas of operation.

To get your copy of this new fact-filled catalog, write today.

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Inc.
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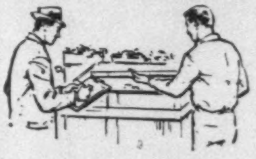

Dempster Field Engineers, located in all sections of the country, make thousands of cost-finding refuse storage and collection surveys every year, without cost or obligation. If you would like to know your disposal costs, and what—if any—avenues of improvement exist, write today on your letterhead.

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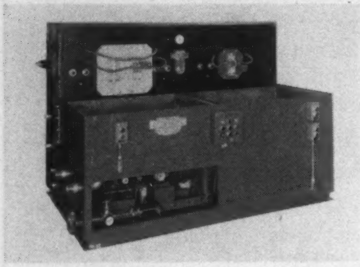
cluding straight shoulders on either right side or left side, or both. Two independent slides — operating in either direction—are applicable for front and rear tooling. (Cone Automatic Machine Co., Inc.)

For more data circle No. 73 on postcard, p. 127

Performs Hardening

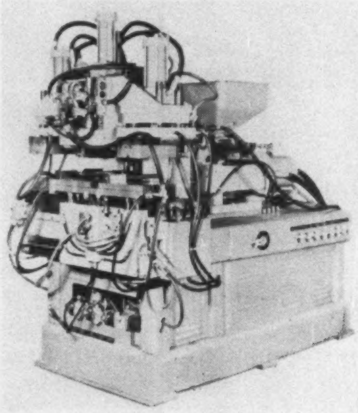
The flick of a selector switch, which in turn selects the desired operating frequency, makes it possible to perform hardening applications at high or low frequencies in a new machine. The unit has a three-position work station, and it will cover almost any type of application requirements. It has dual facilities for oil and water quench mediums used for hardening applications. The machine can be used as a reservoir for both oil or water recirculating systems, or for drop quench systems. (Induction Heating Corp.)



For more data circle No. 74 on postcard, p. 127

Blow Molder

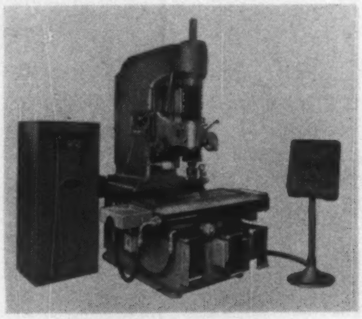
Completely self-contained, an automatic plastic blow-mold machine is a completely-automatic injection type. A variety of plastic products with irregular shapes can be mass produced on this machine. One of its major advantages is the elimination of any secondary operations including reaming and trimming. (The Moslo Machinery Co.)



For more data circle No. 75 on postcard, p. 127

Jig Borer

Numerically controlled, a jig borer features accuracy to "tenths" with high traversing speed. Table and saddle traverse at the same time to reach each position in the shortest possible time. Ultra-precision linear transducers provide position-



"All exposed and unexposed surfaces shall be of STAINLESS STEEL..."

Cafeteria and Executive Kitchen, *Continental Grain Co.*, Offices: New York City. Designed by *Designs for Business, Inc.*, New York, N. Y. Fabricated by *Stainless Food Equipment Co.*, Newark, N. J. Installed by *Ben Mernit*, New York City

- The specifications for this executive cafeteria called for all kitchen metal surfaces, both exposed *and* unexposed, to be constructed of stainless steel. Only *lifetime* stainless steel can offer the durability and ease of maintenance necessary for maximum sanitation in food handling.
- MicroRold Stainless Steel was chosen for its consistent uniformity of gauge, outstanding finish and well-known fabricating qualities.
- *Why not investigate the advantages of stainless steel for your next project?*

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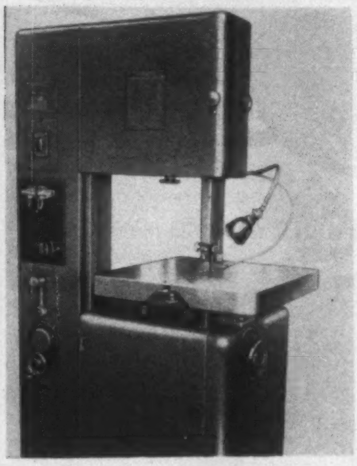
ing accuracy. Setups are fast and easy. The work piece is located under the spindle by turning the micrometer dials of the zero offset. (W. B. Knight Machinery Co.)
For more data circle No. 76 on postcard, p. 127

Band Saw

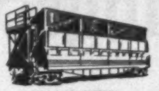
With a turn of the "quik-set" dial, an operator may set or change feed rates instantly on a new metal-cutting band saw. There are no parts to remove or belts to change. Control is accomplished through a completely revised "vari-drive" and rugged two - speed transmission. Speed setting is positive and constant—with no "drift" or variation. Speed changes may be accomplished with ease while the machine is in operation. This factor provides savings by increasing blade life and decreasing the all-important "time" element. (Powermatic Machine Co.)
For more data circle No. 77 on postcard, p. 127



Inhibits Corrosion

Volatile corrosion-inhibitor papers give active and positive protection for nonferrous metals. The new line of packaging papers are not only sulphur-free but actually inhibit oxidation. Copper, copper-containing metals and cadmium now may be wrapped to prevent tarnish and oxidation for several years, despite high humidity or intensive corrosive atmospheres. Actual contact with wrapped surfaces or a tight seal is not required with the papers. (Daubert Chemical Co.)
For more data circle No. 78 on postcard, p. 127

SCALE CARS



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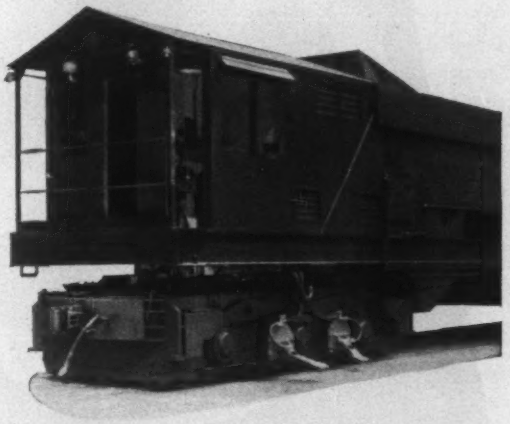

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The Iron Age Summary

Turning Point Set Back Again

Failure of the mild upturn to gain momentum has added new gloom to the steel outlook.

September, once looked for as the start of a major upturn, now looks little better than July and August.

- The turning point in steel operations may have to be set back again.

On the basis of latest orders, the mild upturn of two weeks ago failed to gain momentum. In fact, the rate of incoming orders at some major mills is lower than it was at that time.

Must Pick Up—Against the gloomy status of day-to-day business, it should be remembered that steel is being consumed at a higher rate than new orders and an upturn in business is on the way.

Sooner or later, steel operations will have to come up to the level of the economy.

But the immediate picture does not show when the upturn will come. September orders as yet do not show the expected strength and nothing in the order books now shows anything of a gain in momentum.

Some Exceptions—One possible exception is stainless, where the feeling is the market has turned the corner. There have also been some pipeline releases, with one project to take at least 300,000 tons of large diameter pipe. Others are expected to break soon.

The Factors—These are the factors controlling the market now:

Steel inventories are still large. While this is surprising, it is true. Many steel users will continue to reduce inventories for some weeks.

Demand for railroad and construction steel is off.

Tinplate releases have fallen off and there have been some cancellations of orders.

Steel consumption has fallen off —more than had been expected from seasonal and economic factors. This means that inventories (in terms of days) have automatically lengthened as consumption dropped.

Warehouses are loaded with steel and are not ordering in any strength. There is little reason to expect a change soon.

Automotive ordering of steel is also disappointing—up to now. Automakers also have more inventory than even they expected and the first cars off the 1961 lines are compacts—which take less steel.

September Outlook—As it looks on the basis of current orders, August is shaping up not much better than July. But the discouraging aspect is that September, at the moment, doesn't look much better.

However, some more automotive orders for September are due to materialize and there is evidence that many big users are waiting until the last minute before ordering.

Price Outlook—The price situation is cloudy. There is still no evidence that the industry will raise its prices on or after Dec. 1, at least under present market conditions.

It's an over-simplification, but competition within and from without the industry is too strong.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,589	1,525	1,550	321
Ingot Index				
(1947-1949=100)	98.9	94.9	96.5	20.0
Operating Rates				
North East Coast	63.0	59.0	60.0	12.0†
Buffalo	58.0	57.0*	56.0	0.0†
Pittsburgh	51.0	46.0*	48.0	24.0†
Youngstown	45.0	47.0	45.0	10.0†
Cleveland	50.0	49.0*	48.0	0.0†
Detroit	83.0	81.0*	86.0	22.0†
Chicago	59.0	57.0	57.0	5.0†
Cincinnati	54.0	54.0*	47.0	59.0†
St. Louis	66.0	55.0*	50.0	80.0†
South	61.0	55.0	64.0	12.0†
West	48.0	47.0*	53.0	0.0†
U. S. Rate	55.8	53.5	54.4	11.3

*Revised †IRON AGE Estimate

Source: American Iron And Steel Institute

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.41	$66.41	$66.41	$66.41
Scrap No. 1 hvy (Gross ton)	$32.50	$31.83	$31.50	$39.83
No. 2 bundles	$22.17	$21.50	$21.17	$27.50
Nonferrous				
Aluminum ingot	26.00	26.00*	28.10	26.80
Copper, electrolytic	33.00	33.00	33.00	30.00
Lead, St. Louis	11.80	11.80	11.80	11.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electroytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	103.625	103.75*	103.50	102.50
Zinc, E. St. Louis	13.00	13.00	13.00	11.00

Clinics Designed To Aid Sales

Steel foundry officials feel that salesmen are not getting the most out of sales potential.

A new clinical series is aimed at getting better sales results from foundry salesmen.

■ Steel foundry officials feel their members are losing quite a few big sales these days because salesmen don't give enough information to purchasing agents and engineers. Some "horrible examples" brought out at a recent conference showed an appalling lack of knowledge and interest by both foundry salesmen and customer engineers and purchasing agents.

So sales clinics across the country run by the Steel Founders Society of America, Cleveland, are being stepped up this year to help remedy the condition. Features will be increased cash awards for the product design contest, discussion of quality levels, reports on the campaign for more use of steel castings in bridge construction and, of course, better salesmanship. There is also a report on high speed spin testing of steel castings and forgings for turbine rotating parts.

Better Salesmen Needed—"Our competition now is the heaviest in years," says George Dreher, S.F.S.A. product and market development director. "Our member firms need better salesmen as time goes on. Purchasing agents are more receptive now to money saving ideas and product improvement than they have been in years. Also we now have an import threat.

"This competitive situation shows up once every business cycle and we mean to get into it with both feet. Our real competition is not between foundries but with other materials and methods."

CLOSE LOOK: James Senderling, center, Kennametal, Inc., inspects a large manganese molybdenum steel casting being cut by a Kennametal tool.

The Calendar — Clinics will be held Oct. 20 in New York, Oct. 21 in Chicago and later at a southern site to be named. Los Angeles and Seattle are scheduled in November. These annual meetings were started in 1956 on a formal basis. They were held informally for several years. They contrast in operation with the Gray Iron Founders Society clinics which are for users.

Major requirements for steel castings salesmen outlined at a conference recently by A. A. Ekeberg, Atlas Foundry & Machine Co., Tacoma, Wash. are: Good knowledge of basic casting design and casting metallurgy, more than a rudimentary knowledge of foundry processes and products of his foundry, Customer service over and above normal demand, and, thorough understanding of foundry processes which can cause the customer to think in terms of value rather than price. This includes value of good patterns, good cleaning room practice and modern automated molding and core-making.

Cash Awards—At the conference this year, an expanded design contest will be explained. This year's will be the biggest ever with 20 cash prizes over $100 and more smaller awards. Discussions of quality will center around the levels necessary for given application and the factors involved.

The report on high speed centrifugal tests given by Mr. Dreher is a case history of recent testing of turbine parts by a manufacturer. Castings held together in the test pit up to 14,000 rpm and exceeded the performance of forgings in this respect. The bridge casting report will relate latest progress of an SFSA committee in working for the use of more castings on bridges through better design.

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UNIT ***Mobile Cranes are available in two sizes — the 15-ton Model 357 and the 20-ton Model 1520T. Plus, a complete line of crawler and truck cranes. Your UNIT dealer has complete information — call him soon.***

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Big Auto Orders Fail to Show

August orders for sheet and strip have shown only a small improvement over July.

But September is the real disappointment. Auto buying is below earlier expectations.

- Most mills have closed their books on August tonnages of cold-rolled sheet and strip. And it looks as though the month will register slight improvement over July.

A few weeks ago it looked as though September would mark the upturn, especially for flat-rolled products. Now, however, it is turning into a disappointment. The orders just aren't coming in. Automakers have eased off on orders; other customers are virtually non-existent.

Still Time to Buy — Producers haven't given up on September. There's still plenty of time for users to place orders for September delivery—and expect to get it. Steelmakers are hoping for some rush orders in September. But appraisals of September bookings now range from zero to a 20 pct improvement over August. Now, the big boost isn't expected until October.

Flat-rolled buying picture is spotty on the **East Coast,** as it is in most districts. Some mills have orders enough to call their automotive bookings good. Others hesitate to call them fair.

One Exception—The situation in **Pittsburgh** is said to be only a little better than August. And the overall order volume doesn't indicate any significant improvement. As far as these mills are concerned, September has yet to show itself as the month of the big upturn.

In **Detroit,** the situation is a little different. Local mills, limited almost exclusively to sheet and strip production, have been running well above the national average. But there's little doubt that part of the production is going into inventory in anticipation of automotive orders.

Some **Chicago** area mills look for a pickup next month, especially in cold-rolled sheet. A lesser improvement is counted on in hot-rolled. But the increases aren't expected to reach significant proportions for another month.

Bars—There's been no change in the weakness plaguing bar producers. The only consolation seems to be that customers must be liquidating inventory. Therefore, users will have to start buying against consumption sometime. Buyers are placing only rush orders along the **East Coast;** and these only as needed. August shapes up as no better than July for **Pittsburgh** bar mills. A mild improvement is looked for in September, but it will be October before anything resembling an upturn is expected. However, closer to the automotive centers of **Detroit** and **Cleveland,** cold-finished bars are showing up a little stronger than they did in July.

Stainless—Producers believe the worst is over for stainless and that they are in a rising market. For one thing, says a **Pittsburgh** producer, orders held up surprisingly well during the July vacation period. And **Detroit** automotive suppliers are starting to place orders for stainless to be used as trim on the 1961 cars. The order rate is still modest, but improving.

Plates and Structurals — Just about any plate item is available in two to three weeks from **East Coast** mills. In some cases, mills can even do better than this. Flanged and dished heads can often be obtained from stock. Only a slight improvement in orders for August has been noticed by **Pittsburgh** mills. Even this small gain depends on anticipated orders for new pipeline projects. **Farwest** producers get a break, however, with the release of orders for a large diameter pipeline which will eventually take 300,000 tons of steel.

Pipe and Tubing—There's been a small flurry of orders from jobbers for standard pipe along the **East Coast.** This could make August the best month since April. But it's hard to tell just how long the activity will continue. Mechanical tubing has received some support from manufacturers of boilers and heat exchangers. A few good days are beginning to creep in among all of the poor days for oil country seamless, according to reports from **Pittsburgh.** This could mean inventory liquidation is near an end. Standard pipe has also shown a small but solid pickup.

Tinplate—Demand is still high along the **East Coast,** but demand has eased at **Pittsburgh** where some mills report cancellations.

Tinplate, along with other flat-rolled products, has been comparatively strong throughout the current steel recession.

PURCHASING AGENT'S CHECKLIST

Are more price increases coming? An IRON AGE Special Report. P. 67

Package tooling creates hybrid lathe. P. 99

New aluminum alloy has fine possibilities for high-production die-casting. P. 102

COMPARISON OF PRICES

(Effective August 16, 1960)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Aug. 16 1960	Aug. 9 1960	July 19 1960	Aug. 18 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Aug. 16 1960	Aug. 9 1960	July 19 1960	Aug. 18 1959
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.57
Foundry, South Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	11.00	11.00	11.00	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$31.50*	$30.50	$30.50	$43.50
No. 1 steel, Phila. area	34.50*	33.50	33.50	39.50
No. 1 steel, Chicago	31.50	31.50	30.50	36.50
No. 1 bundles, Detroit	29.50	29.50	27.50	37.50
Low phos., Youngstown	37.00*	34.50	34.50	45.50
No. 1 mach'y cast, Pittsburgh	47.50	47.50	48.50	52.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	50.50
No. 1 mach'y cast, Chicago	47.00*	46.50	45.50	59.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$32.50*	$31.83	$31.50	$39.83
No. 2 bundles	22.17*	21.50	21.17	27.50
Coke, Connelsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.50-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	33.00	33.00	33.00	30.00
Copper, Lake, Conn.	33.00	33.00	33.00	30.00
Tin. Straits, N. Y.	103.625†	103.75**	103.50	102.50
Zinc, East St. Louis	13.00	13.00	13.00	11.00
Lead, St. Louis	11.80	11.80	11.80	11.80
Aluminum, ingot	26.00	26.00**	28.10	26.80
Nickle, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Are Exports Slackening Off?

Exports have been sustaining the scrap market for months in most areas.

Now, there are reports that Japan may cut back purchases. Canada is inactive and European exports are decreasing.

▪ For months, export has been the only element of strength in the scrap market. Particularly in coastal areas, but also on the Great Lakes, export has been a sustaining factor in the market.

Dealers are now talking about lower export. There are reports that Japan may cut back its purchases during the last quarter. Japan has been one of the chief sources of export business.

The Canadian market is already inactive after a rash of buying earlier this month. Mexico continues to make fair purchases, but these are chiefly from the Houston area. European exports are decreasing in most seaport areas.

On the domestic side, prices are firming. But consumer demand is still lacking. In many areas, dealers are now looking for October to be the next buying month. Purchases that are being made are at quoted prices or slightly higher. Dealers, nevertheless, still appear in no hurry to sell.

Pittsburgh—The market moved up a notch this week. This reflects strength shown on industrial lists and activity in nearby districts. At the same time, low prices have slowed collections by yards. There is still no mill support for a stronger market. But scrap tonnage cannot be bought without higher prices. On a late list, the price of No. 1 railroad heavy melting was up from last week. The rise was in line with the trend indicated earlier by industrial offerings.

Chicago—Minor mill purchases failed to boost the general market. Nevertheless, scrap continues to remain firm. At least one major steel producer failed to make expected August purchases. This is believed to be an important reason for the slowdown of price advances that started in July. The price quoted on railroad steel car axles last week was incorrect. It should have read $49 to $50.

Philadelphia—Dealers and brokers are in disagreement on the market status this week. One dealer says, "There is a little better feeling on the part of consuming mills." Another claims things are "stable to stagnant." A third says the situation "is not as good as it was." The general picture again shows a lack of domestic buying. Many mills apparently don't plan to buy until late October. Area dealers say they have heard reports that Japan may cut back its purchasing or fight for lower prices. One dealer terms the reports "very strong."

New York — Export continues brisk. There is also some activity in cast grades. Otherwise, the market is dull. September export is expected to remain at about August levels. Domestic orders for prime steelmaking grades are absent. Prices are unchanged.

Detroit—Things are quiet and there is little trading. The mills just aren't interested in buying scrap. Also, dealers aren't anxious to sell at lower prices. The Canadian market is inactive after a rash of buying earlier this month. Exports to European and Far Eastern ports are decreasing.

Cleveland—Price quotations are up $2.50 on prime dealer grades. Local mills could get only limited tonnage at the offered price. An area foundry bought 2-ft cut structurals at $38, but dealers are not rushing to sell.

Cincinnati — The market is in mid-month doldrums as mills and dealers continue their standoff. A big area factory list is being barged upriver from Cincinnati.

St. Louis—Scrap prices in this area continue to show strength with railroad items pacing the upturn. However, it is not a case of brisk buying. It is just the case of having to pay more money for those purchases made. Cast iron borings are extremely strong.

Birmingham — The market is spotty. There is a fair demand for foundry grades and brokers report some difficulty in filling orders at quoted prices. Openhearth and electric furnace consumers are out of the market.

Buffalo—The market is quiet and generally unchanged with no sales expected until after Labor Day. Most of the trade is reconciled to a sideways movement for some time. Prices of structural and plate two ft and under are up $2, re-establishing a normal differential.

Boston—The market is very quiet. Prices are still firm but domestic action is at a standstill. And there is very little export.

West Coast—Many dealers now believe the mills won't come into the market in September. Some are looking for the buying to start in October. Exporting is slackening.

Houston—The domestic market remains unchanged. But exporting has strengthened some prices. No. 1 heavy melting and No. 2 bundles have increased because of export.

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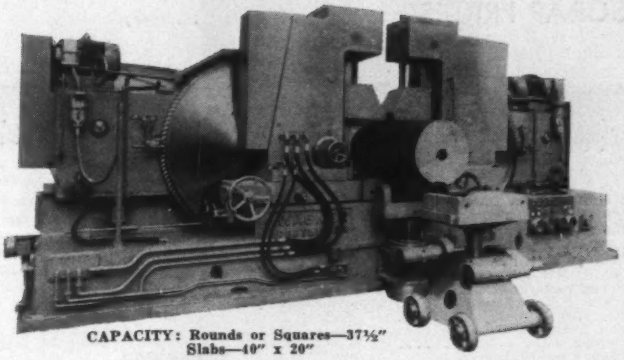

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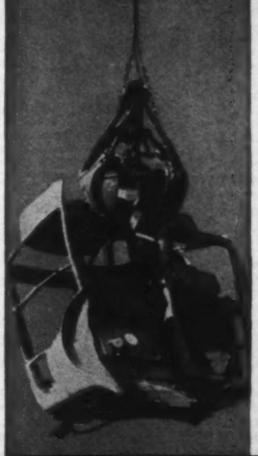

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SCRAP PRICES

(Effective August 16, 1960)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. punch'gs plate	38.00 to 39.00
Heavy turnings	27.00 to 28.00
No. 1 RR hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	50.00 to 51.00
RR specialties	47.00 to 48.00
No. 1 machinery cast	47.00 to 48.00
Cupola cast	38.00 to 39.00
Heavy breakable cast.	36.00 to 37.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	85.00 to 90.00
430 bundles and solids	90.00 to 95.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	37.00 to 38.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	42.00 to 43.00
Low phos. punch'gs plate, ¼ in. and heavier	38.00 to 39.00
Low phos. 2 ft. and under.	36.00 to 37.00
No. 1 RR hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	53.00 to 54.00
Rails 2 ft. and under	49.00 to 50.00
Angles and splice bars	43.00 to 44.00
RR steel car axles	50.00 to 51.00
RR couplers and knuckles.	40.00 to 41.00
No. 1 machinery cast.	46.00 to 48.00
Cupola cast.	41.00 to 42.00
Cast iron wheels	32.00 to 33.00
Malleable	45.00 to 46.00
Stove plate	34.00 to 36.00
Steel car wheels	39.00 to 40.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	85.00 to 90.00
430 bundles and solids	85.00 to 90.00
430 turnings	40.00 to 50.00

Philadelphia Area

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	20.00 to 21.00
Clean cast. chem. borings.	23.00 to 24.00
Low phos. 5 ft and under	37.00 to 38.00
Low phos. 2 ft punch'gs	39.00 to 40.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	27.00 to 28.00
RR specialties	39.00 to 40.00
Rails, 18 in. and under	51.00 to 52.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	38.00 to 39.00
Cast iron car wheels	40.00 to 41.00
Malleable	45.00 to 46.00
No. 1 machinery cast	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.50 to $27.50
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	26.50 to 27.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Low phos. 18 in. and under	35.00 to 36.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	50.00 to 51.00
No. 1 cupola cast.	35.00 to 36.00
Hvy. breakable cast.	31.00 to 32.00
Drop broken cast.	48.00 to 49.00

Youngstown

No. 1 hvy. melting	$35.50 to $36.50
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	35.50 to 36.50
No. 2 bundles	22.00 to 23.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	19.00 to 20.00
Low phos. plate	36.50 to 37.50

Cleveland

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	34.50 to 35.50
No. 2 bundles	19.00 to 20.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft. & under	37.00 to 38.00
Low phos. punch'gs plate.	33.00 to 34.00
Drop forge flashings	32.00 to 33.00
Foundry steel, 2 ft. & under	34.00 to 35.00
No. 1 RR hvy. melting	34.50 to 35.50
Rails 2 ft. and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	47.00 to 48.00
No. 1 machinery cast.	50.00 to 51.00
Stove plate	39.00 to 40.00
Malleable	45.00 to 46.00
Stainless	
18-8 bundles	180.00 to 185.00
18-8 turnings	75.00 to 80.00
430 bundles	80.00 to 85.00

Buffalo

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 busheling	29.00 to 30.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Low phos. plate	36.00 to 37.00
Structurals and plate, 2 ft. and under	38.00 to 39.00
Scrap rails, random lgth.	37.00 to 38.00
Rails 2 ft. and under	47.00 to 48.00
No. 1 machinery cast.	45.00 to 46.00
No. 1 cupola cast	40.00 to 41.00

St. Louis

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	28.00 to 29.00
Foundry steel, 2 ft.	31.00 to 32.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	23.00 to 24.00
No. 1 RR hvy. melting	32.00 to 33.00
Rails, random lengths	40.00 to 41.00
Rails, 18 in. and under	41.00 to 42.00
RR specialties	39.00 to 40.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	35.00 to 36.00
Stove plate	35.00 to 36.00
Cast iron car wheels	35.00 to 36.00
Rerolling rails	52.00 to 53.00
Unstripped motor blocks	36.00 to 37.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	9.00 to 10.00
Electric furnace bundles	32.00 to 33.00
Elec. furnace, 3 ft. & under	32.00 to 33.00
Bar crops and plate	37.00 to 38.00
Structural and plate, 2 ft.	36.00 to 37.00
No. 1 RR hvy. melting	30.00 to 31.00
Scrap rail, random lgth.	39.00 to 40.00
Rails, 18 in. and under	45.00 to 46.00
Angles and splice bars	37.00 to 38.00
No. 1 cupola cast.	45.00 to 46.00
Stove plate	45.00 to 46.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	34.00 to 35.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 dealer bundles	16.00 to 17.00
Machine shop turnings	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	18.00 to 19.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	33.00 to 34.00
Heavy breakable cast.	31.00 to 32.00
Stainless	
18-8 prepared solids	165.00 to 170.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	26.00 to 27.00
Drop forge flashings	26.00 to 27.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Heavy breakable cast.	30.00 to 31.00
Mixed cupola cast.	35.00 to 36.00
Automotive cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	60.00 to 65.00
430 bundles and solids	60.00 to 65.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $24.50
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	24.00 to 24.50
No. 2 bundles	14.00 to 15.00
No. 1 busheling	24.00 to 24.50
Machine shop turn.	5.00 to 6.00
Shoveling turnings	8.00 to 9.00
Clean cast. chem. borings.	12.00 to 13.00
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	32.00 to 33.00
Heavy breakable cast.	27.50 to 28.50

San Francisco

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	30.00
No. 2 bundles	20.00
Machine shop turn.	$14.00 to 15.00
Cast iron borings	14.00 to 15.00
No. 1 cupola bast.	46.00

Los Angeles

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 1 dealer bundles	27.00
No. 2 bundles	17.00
Machine shop turn.	13.00
Shoveling turnings	15.00
Cast iron borings	$15.00 to 16.00
Elec. furnace 1 ft. and under (foundry)	42.00 to 43.00
No. 1 cupola cast.	44.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast	36.00
Mixed yard cast	36.00

Hamilton, Ont.

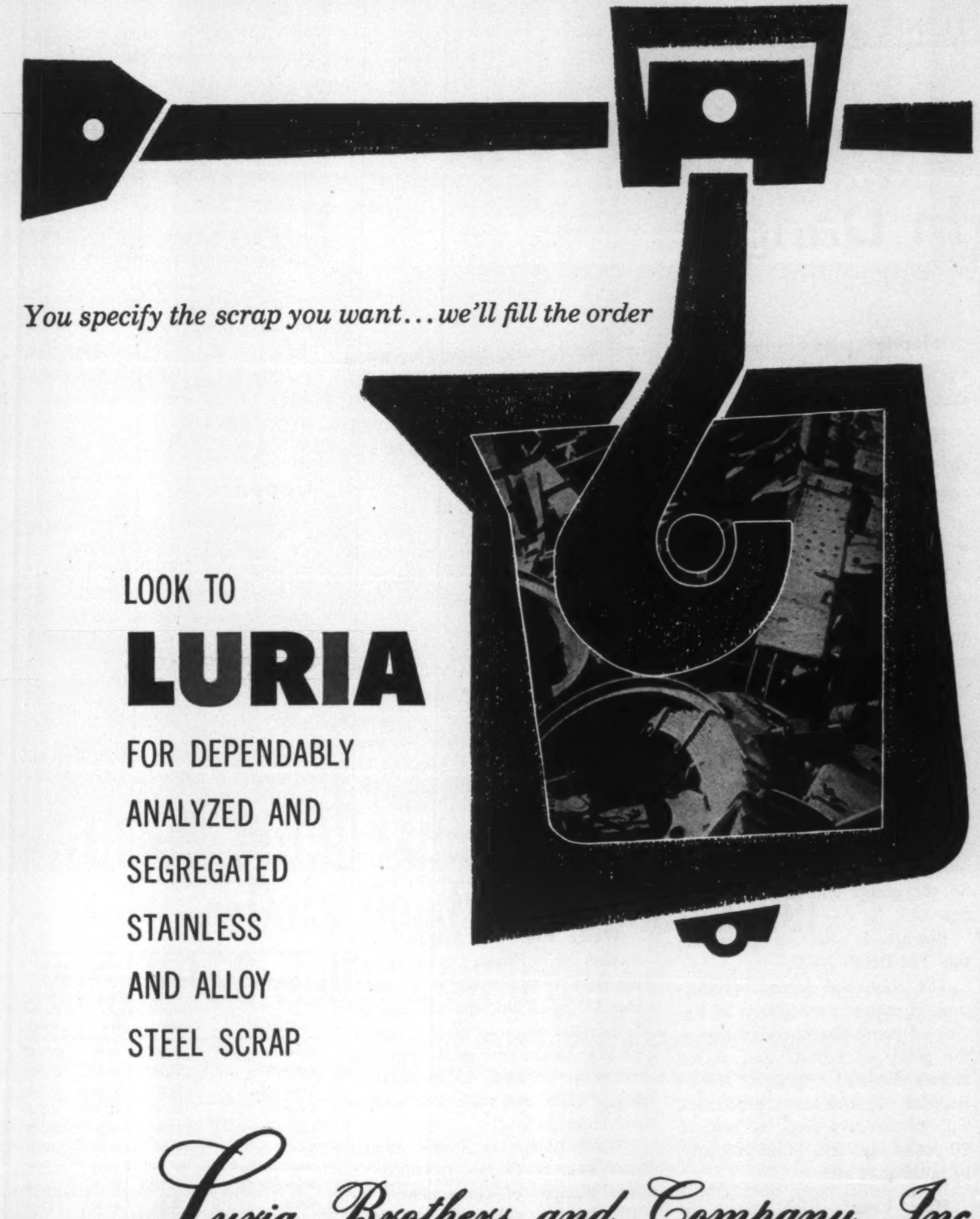
Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$25.80
No. 2 hvy. melting cut 3 ft. and under	22.50
No. 1 dealer bundles	25.80
No. 2 bundles	19.00
Mixed steel scrap	16.00
Bush., new fact., prep'd	25.50
Bush, new fact., unprep'd	20.45
Machine shop turn.	12.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	33.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 2 bundles	18.00
Machine shop turn.	12.00
Shoveling turnings	14.00
Cut structural plate 2 ft. & under	$40.00 to 41.00
Unstripped motor blocks	26.00 to 27.00
Cupola cast.	32.00 to 33.00
Heavy breakable cast.	25.00 to 26.00



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Katanga's Wealth In Danger

Interview with Katanga group shows extent of danger of losing Congo's mineral wealth.

If present technicians are driven out, Russia may be only source for technical aid.

▪ Is there danger that the prolific copper, cobalt, tin and germanium production and potential of the Congo will be lost to the Free World?

This was the contention of a delegation from Katanga in New York last week. They were here seeking to air their case before the United Nations.

No Sounding Board—But as a non-member, they needed a sponsor who is a member. Right now, Katanga is politically too hot to touch. So the group left for home—unheard.

But here is what one spokesman told The IRON AGE:

The continued mineral production, of copper particularly, in Katanga depends almost completely on the group of non-African, skilled technicians and engineers, mostly Belgians. If they leave, production will immediately drop, at best, to 20 pct of capacity. More probably, to nothing at all.

How Long?—Right now, the technicians are on the job because the situation is generally peaceful, with no immediate threat on their lives or well-being, the Katanga spokesman assured.

Reuters, the international news agency, reports Belgian personnel have received large pay increases, and the promise of bonuses when they do leave. And there are other reports that each Belgian already has the necessary documents which provide for his transportation and subsistance to get back to Belgium.

The Chances — The Katanga spokesman said: "If UN troops replace Belgian troops in such a manner that there is fighting, the technicians will leave. And if the UN insists on giving Katanga to Lumumba, we will fight. This will also make the technicians leave. And our minerals industry will have to shut down."

The Katanga delegation was concerned about what would happen after that to its rich minerals industry.

The delegation appeared sure that, in that case, technicians to reopen Katanga's copper mines would come from Russia. His reasoning:

Where Else? — "Belgian technicians are in Katanga because they are paid twice as much as at home. But U. S. technicians are already being paid twice as much as comparable technicians in Belgium. So not many are likely to be recruited here. The only alternate source would be Russia."

Also, Lumumba, leader of the new state of Congo, is called "a true disciple of communism" by Mr. Kibwe, Katanga finance minister.

No Trained Men—What are the chances for Congo or Katanga citizens operating Katanga's copper mines? "Just about impossible," says the Katanga spokesman.

What does Katanga want? What does it think is necessary to keep the Congo copper from disappearing behind the Iron Curtain? A confederation of Free African states. But Katanga would settle for a Congo federation that would leave the area basically the master of its own economy.

Vital Province—Why is Katanga, and the Congo, important to world nonferrous industries? It is well known that the Congo, particularly Katanga, produces about 10 pct of the Free World's copper supply. Further, this is low cost metal that tends to keep the world copper price down.

Copper

Export demand for refined copper has been increasing rapidly.

Commerce Dept. report shows 52,000 tons were shipped overseas during the first quarter. In the first two months of the second quarter this figure was topped.

During April, 31,000 tons were exported, with 51,000 tons shipped in May.

There was also strong foreign demand for copper-based scrap.

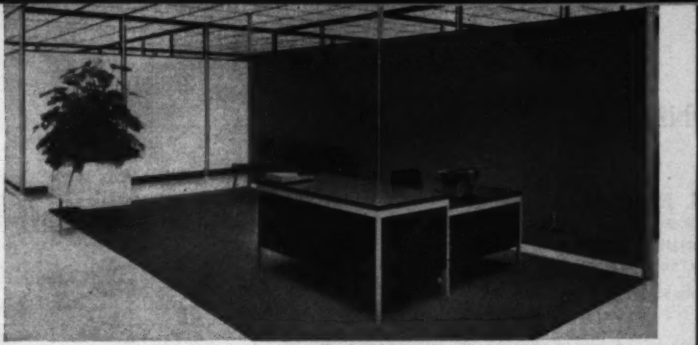
Tin prices for the week: Aug. 10—103.75; Aug. 11—103.50; Aug. 12—103.125; Aug. 15—103.125; Aug. 16—03.125.*

* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum Ingot	26.00	24.70	12/17/59
Copper (E)	33.00	30-33	11/12/59
Copper (CS)	33.00	35.00	3/11/60
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	11.80	12.30	12/21/59
Lead, N. Y.	12.00	12.50	12/21/59
Magnesium ingot	36.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/6/56
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	13.00	12.50	1/8/60
Zinc, N. Y.	13.50	13.00	1/8/60

ALUMINUM: 99% Ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 148.



Typical Hauserman interior wall installation.

The E. F. HAUSERMAN COMPANY Gets Dead Flat Sheet Steel with VOSS Roller Levelers

...and saves time and money doing it!

Hauserman standards are *tough*. Every sheet of steel used in a Hauserman movable interior wall is inspected on a slate table for absolute flatness. Before Voss levelers were installed, the company used stretcher-leveled sheets . . . and still had to reject 33% as not meeting their severe specifications. Now steel is ordered in coils, and Voss-leveled on their own processing line. Rejects are consistently held under 5%, and the company gains the economy and flexibility of handling steel in coil form. Voss levelers have operated at Hauserman for 10 trouble-free years. They help the company maintain the most rigid quality standards in the movable partition industry.

Voss levelers are currently at work in plants of many primary steel and aluminum producers and major fabricators. Applications include high speed galvanizing lines, hot and cold rolled shear lines, steel plate, aluminum sheets and coils, and others. Let Voss put its experience to work on your leveling problems.

Voss ENGINEERING CO.

7301 Penn Ave. Pittsburgh 8, Pa. Churchill 2-4422

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.038	.048-.061	.077-.096	.136-.250
1100, 3003	47.8	47.3	46.2	45.1
5052	54.2	53.0	50.8	49.2
6061-0	51.0	49.8	47.9	46.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	44.7-46.2	53.2-60.8
18-32	45.2-46.8	57.7-79.9
33-38	48.8-51.4	83.3-94.5
39-44	58.7-62.4	99.9-121.0

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type ↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand, Grade	......	67.9	69.0	77.9	103.1
AZ31B Spec.	......	93.3	96.9	108.7	171.3
Tread Plate	......	70.6	71.7	......	......
Tooling Plate	73.0	......	......	......	......

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)	37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting)	40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.13	....	54.86	58.32
Brass, Yellow	50.57	50.86	50.26	54.23
Brass, Low	53.53	53.82	53.22	57.09
Brass, R L	54.58	54.87	54.27	58.14
Brass, Naval	55.12	....	48.68	58.78
Muntz Metal	53.20	....	48.26	....
Momm. Bz.	56.17	56.46	55.86	59.48
Mang. Bz.	58.86	....	52.21	....
Phos. Bz. 5%	77.44	....	78.10	....

Free Cutting Brass Rod........................36.06

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.	29.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be	$65.00
Beryllium copper, per lb conta'd Be	$43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading	$71.50
Bismuth, ton lots	$ 2.25
Cadmium, del'd	$ 1.50
Calcium, 99.9% small lots	$ 4.55
Chromium, 99.8% metallic base	$ 1.31
Cobalt, 97-99% (per lb)	$1.50 to $1.57
Germanium, per gm, f.o.b. Miami, Okla., refined	29.95 to 36.95
Gold, U. S. Treas., per troy oz.	$35.00
Indium, 99.9%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$75 to $85
Lithium, 98%	$9.00 to $12.00
Magnesium sticks, 10,000 lb.	57.00
Mercury, dollars per 76-lb flask f.o.b. New York	$210 to $212
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel	69.60
Palladium, dollars per troy oz.	$24 to $26
Platinum, dollars per troy oz.	$82 to $85
Rhodium	$137 to $140
Silver ingots (¢ per troy oz.)	91.375
Thorium, per kg.	$43.00
Vanadium	$ 3.65
Zirconium sponge	$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot	
No. 115	29.25
No. 120	28.25
No. 123	27.25
80-10-10 ingot	
No. 305	33.75
No. 315	31.50
88-10-2 ingot	
No. 210	42.00
No. 215	38.75
No. 245	34.00
Yellow ingot	
No. 405	23.75
Manganese bronze	
No. 421	28.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	25.25-25.50
0.60 copper max.	25.00-25.25
Piston alloys (No. 132 type)	27.00-28.00
No. 12 alum. (No. 2 grade)	23.75-24.25
108 alloy	24.25-24.75
195 alloy	26.75-27.75
13 alloy (0.60 copper max.)	24.75-25.00
AXS-679 (1 pct zinc)	24.00-25.00

(Effective Aug. 16, 1960)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½%	24.75-25.75
Grade 2—92-95%	23.50-24.50
Grade 3—90-92%	22.50-23.50
Grade 4—85-90%	22.00-23.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¼
Yellow brass	22¼	20¼
Red brass	25¾	25
Comm. bronze	26½	26
Mang. bronze	20¾	20
Free cutting rod ends.	21¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	27¼
No. 2 copper wire	25½
Light copper	23¼
*Refinery brass	23¾
Copper bearing material	22¾

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	27¼
No. 2 copper wire	25½
Light copper	23¼
No. 1 composition	21
No. 1 comp. turnings	20½
Hvy. yellow brass solids	16
Brass pipe	15
Radiators	17

Aluminum

Mixed old cast.	13½—14
Mixed new clips	14½—15½
Mixed turnings, dry	14 —14½

Dealers' Scrap

(Dealers' Buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	23½—24
No. 2 copper wire	21½—22
Light copper	19½—20
Auto radiators (unsweated)	13¼—13¾
No. 1 composition	18 —18½
No. 1 composition turnings	16½—17
Cocks and faucets	13¾—14¼
Clean heavy yellow brass	12¾—13¼
Brass pipe	14¼—14¾
New soft brass clippings	14½—15
No. 1 brass rod turnings	13¼—13¾

Aluminum

Alum. pistons and struts	7½— 8
Aluminum crankcase	9½—10
1100 (2s) aluminum clippings	12½—13
Old sheet and utensils	9½—10
Borings and turnings	5½— 6
Industrial castings	10 —10½
2020 (24s) clippings	12½—13

Zinc

New zinc clippings	7 — 7¼
Old zinc	4½— 5
Zinc routings	3¼— 3½
Old die cast scrap	2¾— 3

Nickel and Monel

Pure nickel clippings	52-54
Clean nickel turnings	40
Nickel anodes	52-54
Nickel rod ends	52-54
New Monel clippings	23-23.50
Clean Monel turnings	16.50-17
Old sheet Monel	22-23
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed	15

Lead

Soft scrap lead	8 — 8¼
Battery plates (dry)	3 — 3¼
Batteries, acid free	2 — 2¼

Miscellaneous

Block tin	79 —80
No. 1 pewter	59 —60
Auto babbitt	43 —44
Mixed common babbitt	10¼—10¾
Solder joints	14½—15
Siphon tops	41
Small foundry type	9¾—10¼
Monotype	9¾—10¼
Lino. and stereotype	8¾— 9
Electrotype	7½— 7¾
Hand picked type shells	5¼— 5¾
Lino. and stereo. dross	2¼— 2¾
Electro dross	2¼— 2¾

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 _B3_		5.55 _B3_	8.10 _B3_	5.55 _B5_						
	Buffalo, N. Y.	$80.00 _R3, B3_	$99.50 _R3, B3_	$119.00 _R3, B3_	6.50 _B3_	5.55 _B3_	8.10 _B3_	5.55 _B3_	5.10 _B3,_	7.425 _S10, R7_	7.575 _B3_			
	Phila., Pa.									7.875 _P15_				
	Harrison, N. J.													15.55 _C11_
	Conshohocken, Pa.		$104.50 _A2_	$126.00 _A2_					5.15 _A2_		7.575 _A2_			
	New Bedford, Mass.									7.875 _R6_				
	Johnstown, Pa.	$80.00 _B3_	$99.50 _B3_	$119.00 _B3_		5.55 _B3_	8.10 _B3_							
	Boston, Mass.									7.975 _T8_				15.90 _T8_
	New Castle, Pa.									7.425* _M8_				
	New Haven, Conn.									7.875 _D1_				
	Baltimore, Md.									7.425 _T8_				15.90 _T8_
	Phoenixville, Pa.					5.55 _P2_		5.55 _P2_						
	Sparrows Pt., Md.								5.10 _B3_		7.575 _B3_			
	New Britain, Wallingford, Conn.			$119.00 _N8_						7.875 _W1,S7_				
	Pawtucket, R. I. Worcester, Mass.									7.975 _N7, A5_				15.90 _N7_ 15.70 _T8_
MIDDLE WEST	Alton, Ill.								5.30 _L1_					
	Ashland, Ky.								5.10 _A7_		7.575 _A7_			
	Canton-Massillon, Dover, Ohio		$102.00 _R3_	$119.00 _R3, T5_						7.425 _G4_		10.80 _G4_		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 _U1, R3_	$99.50 _U1, R3,W8_	$119.00 _U1, R3,W8_	6.50 _U1_	5.50 _U1, W8,P13_	8.05 _U1, Y1,W8_	5.50 _U1_	5.10 _W8, N4,A1_	7.525 _A1, T8, M8_ 7.525* _M8_	7.575 _W8_		8.40 _W8, S9,I3_	15.55 _A1, S9,C4,T8_
	Cleveland, Ohio									7.425 _A5,J3_		10.75 _A5_	8.40 _J3_	15.60 _N7_
	Detroit, Mich.			$119.00 _R5_					5.10 _G3, M2_	7.425 _M2, S1, D1,P11_	7.575 _G3_	10.80 _S1_		
	Anderson, Ind.									7.425 _G4_				
	Gary, Ind. Harbor, Indiana	$80.00 _U1_	$99.50 _U1_	$119.00 _U1, Y1_		5.50 _U1, I3_	8.05 _U1, J3_	5.50 _I3_	5.10 _U1, I3,Y1_	7.425 _Y1_	7.575 _U1, I3,Y1_	10.90 _Y1_	8.40 _U1, Y1_	
	Sterling, Ill.	$80.00 _N4_				5.50 _N4_	7.75 _N4_	5.50 _N4_	5.20 _N4_					
	Indianapolis, Ind.									7.575 _R5_				15.70 _R5_
	Newport, Ky.								5.10 _A9_				8.40 _A9_	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 _S1, C10_	$119.00 _C10,S1_					5.10 _R3, S1_	7.425 _R3, T4,S1_	7.575 _R3, S1_	10.80 _R3, S1_	8.40 _S1_	15.55 _S1_
	Owensboro, Ky.	$80.00 _G5_	$99.50 _G5_	$119.00 _G5_										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 _U1, P6_	$99.50 _U1, C11,P6_	$119.00 _U1, C11,B7_	6.50 _U1_	5.50 _U1, J3_	8.05 _U1, J3_	5.50 _U1_	5.10 _P6_	7.425 _J3,B4_ 7.525 _E3_			8.40 _S9_	15.55 _S9_ 15.60 _N7_
	Weirton, Wheeling, Follansbee, W. Va.				6.50 _U1, W3_	5.50 _W3_		5.50 _W3_	5.10 _W3_	7.425 _W5_	7.575 _W3_	10.80 _W3_		
	Youngstown, Ohio	$80.00 _R3_	$99.50 _Y1, C10_	$119.00 _Y1_			8.05 _Y1_		5.10 _U_	7.425 _Y1,R5_	7.575 _U1, Y1_	10.95 _Y1_	8.40 _U1, Y1_	15.55 _R5, Y1_
WEST	Fontana, Cal.	$90.50 _K1_	$109.00 _K1_	$140.00 _K1_		6.30 _K1_	8.85 _K1_	6.45 _K1_	5.825 _K1_	9.20 _K1_				
	Geneva, Utah		$99.50 _C7_			5.50 _C7_	8.05 _C7_							
	Kansas City, Mo.					5.60 _S2_	8.15 _S2_						8.65 _S2_	
	Los Angeles, Torrance, Cal.		$109.00 _B2_	$139.00 _B2_		6.20 _C7, B2_	8.75 _B2_		5.85 _C7, B2_	9.30 _C1,R5_			9.60 _B2_	17.75 _J3_
	Minnequa, Colo.					5.80 _C6_			6.20 _C6_	9.375 _C6_				
	Portland, Ore.					6.25 _O2_								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 _B2_			6.15 _B2_	8.70 _B2_		5.85 _C7, B2_					
	Seattle, Wash.		$109.00 _B2_			6.25 _B2_	8.80 _B2_		6.10 _B2_					
SOUTH	Atlanta, Ga.					5.70 _A8_			5.10 _A8_					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 _T2_	$99.50 _T2_			5.50 _T2 R3,C16_	8.05 _T2_		5.10 _T2, R3,C16_		7.575 _T2_			
	Houston, Lone Star, Texas		$104.50 _S2_	$124.00 _S2_		5.60 _S2_	8.15 _S2_						8.65 _S2_	

* Electro-galvanized-plus galvanizing extras.

(Effective Aug. 15, 1960)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Holloware Enameling 29 ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3,W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3*‡	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3,Y1*	6.275 *U1, I3,Y1*	6.875 *U1, I3*	6.775 *U1, I3,Y1*	7.225 *U1*	7.525 *U1, Y1,I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1,Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3*‡	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3,P6*	6.275 *U1, J3,P6*	6.875 *U1, J3* 7.50 *E3*‡	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3,P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3,W5*	6.875 *W3, W5* 7.50 *W3*‡		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3*‡	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2,R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

‡ Electrogalvanized sheets.

(Effective Aug. 15, 1960)

*7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875*L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5 675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, B5*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.25 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher.

(Effective Aug. 15, 1960).

* Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1	Acme Steel Co., Chicago
A2	Alan Wood Steel Co., Conshohocken, Pa.
A3	Allegheny Ludlum Steel Corp., Pittsburgh
A4	American Cladmetals Co., Carnegie, Pa.
A5	American Steel & Wire Div., Cleveland
A6	Angel Nail & Chaplet Co., Cleveland
A7	Armco Steel Corp., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A9	Acme-Newport Steel Co., Newport, Ky.
A10	Alaska Steel Mills, Inc., Seattle, Wash.
B1	Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2	Bethlehem Steel Co., Pacific Coast Div.
B3	Bethlehem Steel Co., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin, Inc., Harvey, Ill.
B6	Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7	A. M. Byers, Pittsburgh
B8	Braeburn Alloy Steel Corp., Braeburn, Pa.
C1	Calstrip Steel Corp., Los Angeles
C2	Carpenter Steel Co., Reading, Pa.
C4	Claymont Products Dept., Claymont, Del.
C6	Colorado Fuel & Iron Corp., Denver
C7	Columbia Geneva Steel Div., San Francisco
C8	Columbia Steel & Shafting Co., Pittsburgh
C9	Continental Steel Corp., Kokomo, Ind.
C10	Copperweld Steel Co., Pittsburgh, Pa.
C11	Crucible Steel Co. of America, Pittsburgh
C13	Cuyahoga Steel & Wire Co., Cleveland
C14	Compressed Steel Shafting Co., Readville, Mass.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Div., Birmingham
C18	Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
D1	Detroit Steel Corp., Detroit
D2	Driver, Wilbur B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
D4	Dickson Weatherproof Nail Co., Evanston, Ill.
E1	Eastern Stainless Steel Corp., Baltimore
E2	Empire-Reeves Steel Corp., Mansfield, O.
E3	Enamel Products & Plating Co., McKeesport, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
F2	Fitzsimons Steel Corp., Youngstown
F3	Follansbee Steel Corp., Follansbee, W. Va.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Corp., Detroit
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owenboro, Ky.
H1	Hanna Furnace Corp., Detroit
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Iron Corp., Cleveland
J1	Jackson Iron & Steel Co., Jackson, O.
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Calif.
K2	Keystone Steel & Wire Co., Peoria
K4	Keystone Drawn Steel Co., Spring City, Pa.
L1	Laclede Steel Co., St. Louis
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
M1	Mahoning Valley Steel Co., Niles, O.
M2	McLouth Steel Corp., Detroit
M3	Mercer Tube & Mfg. Co., Sharon, Pa.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M7	Milton Steel Products Div., Milton, Pa.
M8	Mill Strip Products Co., Evanston, Ill.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M10	Mill Strip Products Co., New Castle, Pa.
N1	National Supply Co., Pittsburgh
N2	National Tube Div., Pittsburgh
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle
N7	Newman Crosby Steel Co., Pawtucket, R. I.
N8	Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9	Nelson Steel & Wire Co.
O1	Oliver Iron & Steel Co., Pittsburgh
O2	Oregon Steel Mills, Portland
P1	Page Steel & Wire Div., Monessen, Pa.
P2	Phoenix Steel Corp., Phoenixville, Pa.
P3	Pilgrim Drawn Steel Div., Plymouth, Mich.
P4	Pittsburgh Coke & Chemical Co., Pittsburgh
P6	Pittsburgh Steel Co., Pittsburgh
P7	Portsmouth Div., Detroit Steel Corp., Detroit
P8	Plymouth Steel Co., Detroit
P9	Pacific States Steel Co., Niles, Cal.
P10	Precision Drawn Steel Co., Camden, N. J.
P11	Production Steel Strip Corp., Detroit
P13	Phoenix Mfg. Co., Joliet, Ill.
P14	Pacific Tube Co.
P15	Philadelphia Steel and Wire Corp.
R1	Reeves Steel & Mfg. Div., Dover, O.
R2	Reliance Div., Eaton Mfg. Co., Massillon, O.
R3	Republic Steel Corp., Cleveland
R4	Roebling Sons Co., John A., Trenton, N. J.
R5	Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon Pa.
S2	Sheffield Steel Div., Kansas City
S3	Shenango Furnace Co., Pittsburgh
S4	Simonds Saw and Steel Co., Fitchburg, Mass.
S5	Sweet's Steel Co., Williamsport, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S9	Superior Steel Div. of Copperweld Steel Co.
S10	Seneca Steel Service, Buffalo
S11	Southern Electric Steel Co., Birmingham
S12	Sierra Drawn Steel Corp., Los Angeles, Calif.
S13	Seymour Mfg. Co., Seymour, Conn.
S14	Screw and Bolt Corp. of America, Pittsburgh, Pa.
T1	Tonawanda Iron Div., N. Tonawanda, N. Y.
T2	Tennessee Coal & Iron Div., Fairfield
T3	Tennessee Products & Chem. Corp., Nashville
T4	Thomas Strip Div., Warren, O.
T5	Timken Steel & Tube Div., Canton, O.
T7	Texas Steel Co., Fort Worth
T8	Thompson Wire Co., Boston
U1	United States Steel Corp., Pittsburgh
U2	Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3	Ulbrich Stainless Steels, Wallingford, Conn.
U4	U. S. Pipe & Foundry Co., Birmingham
W1	Wallingford Steel Co., Wallingford, Conn.
W2	Washington Steel Corp., Washington, Pa.
W3	Weirton Steel Co., Weirton, W. Va.
W4	Wheatland Tube Co., Wheatland, Pa.
W5	Wheeling Steel Corp., Wheeling, W. Va.
W6	Wickwire Spencer Steel Div., Buffalo
W7	Wilson Steel & Wire Co., Chicago.
W8	Wisconsin Steel Div., S. Chicago, Ill.
W9	Woodward Iron Co., Woodward, Ala.
W10	Wyckoff Steel Co., Pittsburgh
W12	Wallace Barnes Steel Div., Bristol, Conn.
Y1	Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities		Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
	City Delivery‡ Charge	Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	....	....	....	....
Baltimore**	$.10	8.37	9.71	10.16	10.78	8.94	9.63	9.15	11.90	17.48	16.48	21.58	20.83
Birmingham**		8.46	10.20	10.69	9.45	8.41	8.47	8.26	13.14	16.76	....	....	....
Boston**	.10	9.77	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	8.95	10.10	11.30	10.80	9.15	9.80	9.15	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.72	10.35	10.30	10.89	8.56	9.06	8.70	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	8.89	10.41	10.35	11.21	8.94	9.62	9.02	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.72[1]	10.13	11.39	11.01	8.80	9.45	8.81	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	....	....	....	20.84
Detroit**	.15	8.98	10.61	10.65	11.26	8.93	9.62	9.01	11.16	17.38	16.38	21.48	20.73
Houston**		9.22	10.03	12.19[3]	10.78	8.95	8.86	8.63	13.10	17.50	16.55	21.55	20.85
Kansas City**	.15	9.36	11.02	11.50	11.02	9.25	9.95	9.46	11.72	17.17	15.87	21.87	21.12
Los Angeles**		9.59[1]	11.29	12.20	11.29	9.82	10.54	9.67	14.20	18.30	17.35	22.90	22.20
Memphis**	.15	9.99	10.20	....	11.39	10.27	10.48	10.07	12.89	....	....	....	....
Milwaukee**	.15	8.86	10.49	10.44	11.03	8.70	9.28	8.84	11.04	17.24	16.24	21.24	20.49
New York	.10	9.46	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	....	....	8.90	8.65	9.20	8.90	10.70	....	....	....	....
Philadelphia**	.10	8.95	10.10	10.76	10.95	9.30	9.95	9.35	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	8.72	10.13	11.28	10.99	8.56	9.06	8.70	11.40	17.10	16.10	19.70	20.45
Portland**		10.20	12.05	12.35	12.20	10.35	10.80	10.20	16.65	18.50	17.45	20.75	20.25
San Francisco**	.10	10.27	11.79[2]	11.55	11.88	10.48	10.59	10.17	15.20	18.30	17.35	22.90	22.20
Seattle**		10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	8.92	10.75	10.68	11.09	8.77	9.29	8.92	11.43	17.48	16.48	21.58	20.83
St. Paul**	.15	8.99	9.74	10.99	11.16	8.83	9.33	8.97	11.64	....	16.69	....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Aug. 15, 1960)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*			
Birmingham *W9*	62.00	62.50*	66.50		
Birmingham *U4*	62.00	62.50*	66.50		
Buffalo *R3*	66.00	66.50	67.00	67.50	
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	
Chester *P2*	68.00	68.50	69.00		
Chicago *I4*	66.00	66.50	66.50	67.00	
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50			
Geneva, Utah *C7*	66.00	66.50			
Granite City *G2*	67.90	68.40	68.90		
Hubbard *Y1*			66.50		
Ironton, Utah *C7*	66.00	66.50			
Lyles, Tenn. *T3*					73.00
Midland *C11*	66.00				
Minnequa *C6*	68.00	68.50	69.00		
Monessen *P6*	66.00				
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*		66.50	67.00	67.50	
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00		66.50	67.00	
So. Chicago *R3*	66.00	66.50	66.50	67.00	
So. Chicago *W8*	66.00		66.50	67.00	
Swedeland *A2*	68.00	68.50	69.00	69.50	73.00†
Toledo *I4*	66-00	66.50	66.50	67.00	
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*			66.50		

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

*Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container)	*Pct*
Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container)	*Pct*
Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Add 7½ pct for nuts assembled to bolts)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Discount Bolts
Full Cartons	46	46

Machine Screws—bulk

¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25 31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	43.75	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8*; Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* wensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa , *C2.*

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

		Discount Hex	Discount Square
Full Cartons		46	57
Bulk			
¼ in. diam or smaller	25,000 pcs		
5/16 or ⅜ in. diam		56	60
	15,000 pcs	56	60

Rivets

	Base per 100 *lb*
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Aug. 15, 1960)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3****	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*						9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*						9.00	9.55
Cleveland *A6*							
Cleveland *A5*						9.00	
Crawf'dsv. *M4***	175	193	...	214	199	9.10	9.85
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡						
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****						9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*						9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.95	10.50
Rankin Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*			...	236		9.95	10.50
SparrowsPt. *B3***	175		...	215	198	9.10	9.775
Struthers, O. *Y1**						8.65	9.20
Worcester *A5*	179					9.30	9.85
Williamsport *S5*							

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	......	......	......	......	......	......	......	......
Youngstown *R3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Fontana *K1*	+10.75	+26.00	+7.75	+22.00	+4.25	+17.50	+1.75	+16.75	+1.25	+15.75	+0.75	+15.25	0.75	+15.50	......	......	......	......	......	......	......	......
Pittsburgh *J3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Alton, Ill. *L1*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	......	......	......	......	......	......	......	......
Sharon *M3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Fairless *N2*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	......	......	......	......	......	......	......	......
Pittsburgh *N1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Wheeling *W5*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Wheatland *W4*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Youngstown *Y1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Indiana Harbor *Y1*	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50	......	......	......	......	......	......	......	......
Lorain *N2*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50	......	......	......	......	......	......	......	......
Youngstown *R3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Fairless *N2*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50	......	......	......	......	......	......	......	......
Fontana *K1*	+6.25	......	+2.25	......	0.75	......	1.25	......	1.75	......	2.25	......	2.75	......	......	......	......	......	......	......	......	......
Pittsburgh *J3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Alton, Ill. *L1*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50	......	......	......	......	......	......	......	......
Sharon *M3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Pittsburgh *N1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Wheeling *W5*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Wheatland *W4*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Youngstown *Y1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Indiana Harbor *Y1*	5.75	+8.0	9.75	+4.0	12.75	0.50	13.25	+0.75	13.75	0.25	14.25	0.75	14.75	+0.50	......	......	......	......	......	......	......	......
Lorain *N2*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	139.8
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

COLUMBIA TOOL STEELS

VANADIUM FIREDIE (type H13)—
the "Old Pro" unbeaten champion
of the hot work steels

COLUMBIA TOOL STEEL COMPANY
400 Lincoln Highway
Chicago Heights, Illinois

TOOL COLUMBIA STEELS

ELECTROLIFT

For years of steady service—

ELECTROLIFT WORM-DRIVE HOISTS

- **Simple to operate**—one man control, push-button or rope
- **Built to last**—with quality parts and automatic lubrication
- **Safe**—alloy steel worm-drive brake holds loads securely
- **Compact**—no overhung gears . . . allow close headroom
- **Clean and quiet**—working parts are fully enclosed

ElectroLift worm-drive hoists give you smooth, fast control over loads of from ¼ to 10 tons. For details on speeds and models, consult your ElectroLift representative, listed in the classified directory.

WORM DRIVE ELECTROLIFT HOISTS

6456

204 Sargeant Avenue **Clifton, N. J.**

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C	41.00	0.50% C	32.75
0.05% C	33.50	1.00% C	32.50
0.10% C	33.25	1.50% C	32.25
0.20% C	33.00	2.00% C	32.00

3-5% C, 53-63% Cr, 2.5% max. Si	26.00
4-6% C, 58-63% Cr, 3-6% Si	22.50
5-8% C, 58-63% Cr, 3-6% Si	22.50
6-8% C, 50-56% Cr, 4-7% Si	22.00
4.00-4.50% C, 60-70% Cr, 1.2% Si	28.75
0.025% C (Simplex)	31.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed delivered, ton lots, 97.25% min. Cr, 1% max. Fe.

0.10% max. C	$1.29
9 to 11% C, 88-91% Cr, 0.75% Fe	1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.15
Ton lots	1.17
Less ton lots	1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	24.50	14.60
Ton lots	29.75	16.05
Less ton lots	31.35	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads, bulk	24.00
Ton lots	27.95
Less ton lots	29.45

Calcium-Maganese—Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads, bulk	23.00
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload bulk	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 75 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.00
Houston, Tex.	11.00
Johnstown, Pa.	11.00
Lynchburg, Va.	11.00
Neville Island, Pa.	11.00
Sheridan, Pa.	11.00
Philo, Ohio	11.00
Rockwood, Tenn.	11.00
S. Duquesne	11.00

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	13.70
Ton lots packed in bags	16.10

Spiegeleisen

Per gross ton, lump, f.o.b., 3% Si max.

	Palmerton, Pa.		Neville Is., Pa.
Mn	10 lb, pig	35 lb, down	35 lb
16-19%	$98.00	$96.00	$100.50
19-21%	100.00	98.00	102.50
21-23%	102.50	100.00	105.50

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads, bulk	34.25
Ton lots, palletized	36.25
250 to 1999 lb	39.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 24.00

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads (Bulk)	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	31.10	33.90	35.10
0.30% max. C	29.80	32.60	33.80
0.50% max. C	28.50	31.30	32.50
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	27.00	29.80	31.00

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b. shipping point.

Carloads bulk	11.60
Ton lots, packed	13.25
Carloads, bulk, delivered, per lb of briquet	14.00
Briquets, packed pallets, 2000 lb up to carloads	16.40

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, frieght allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe	22.95	21.65
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	8.00
Ton lots, packed	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	14.60	75% Si	16.90
65% Si	15.75	85% Si	18.60
		90% Si	20.00

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth	3.20
Crucible	3.30
High speed steel	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb	2.40	3.30	4.55

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk	9.85¢
Ton lots	11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 58-62% Cb, 2 in. x D, delivered per pound

Ton lots	$3.45
Less ton lots	3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage,

per gross ton	$120.00
10 tons to less carload	$131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots,

per lb contained Ti	$1.50
Less ton lots	$1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $255.00

Ferrotungsten, ¼ x down packed per pounds contained W, ton lots delivered $2.15 (nominal)

Molybdic oxide, briquets per lb. contained Mo, f.o.b. Langeloth,

Pa.	$1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa.	$1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 $1.38

Zirconium silicon, per lb of alloy

35-40% del'd, carloads, bulk	26.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload	$5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound 30¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	18.25¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots $1.20

F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb & over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd

Ton lots (packed)	$1.46
Less ton lots (packed)	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

(Effective Aug. 15, 1960)

RAILWAY EQUIPMENT
USED and RECONDITIONED
RAILWAY CARS and REPAIR PARTS

FLAT CARS
4—50-Ton Capacity, 43' long
Steel Underframe

DIESEL-ELECTRIC LOCOMOTIVES
1, G. E. 25-Ton, 150 H.P., Std. Ga.
3, G. E. 44-Ton, 400 H.P., Std. Ga.
1, G. E. 80-Ton, 500 H.P., Std. Ga.
1, BALDWIN, 120-Ton, 1000 H.P., Std. Ga.

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1—3" Rd. Cap. Open End Vertical Bar Shear

1—2¾" Cap. Buffalo Billet Shear

No. 0 Sutton Double Head Gag Straightener, Cap. 1½" Square

CURRY & HUDSON ASSOCIATES, INC.
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REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

MOTOR GENERATOR SETS

TYPICAL FOR MILL & REEL DRIVES

(2)—3500/3000-KW Al.Chal. 5-unit Sets, (2) 1750-KW, Gen. 350/300—700/600-V.D.C., (1) 5000-HP Syn. Motor 13800/6900/4160-V., 3 ph., 60 cy., with exciters.
(1)—1325-KW Whse. 2-unit Set, Gen. 600-V.D.C., with 2250-HP Syn. Motor 2300-V., 3 ph., 60 cy.
(1)—1520-KW 3-unit Set, (2) 760-KW Gen., 600-V.D.C., (1) 2250-HP Syn. Motor, 2300-V., 3 ph., 60 cy.
(1)—200-KW General Electric 3-unit Set, (2) 100-KW Gen. 250-V.D.C., with 300 HP Syn. Motor, 2300-V.D.C., 3 ph., 60 cy.
We can supply various Motors with these Sets, together with exciters and controls as a COMPLETE PACKAGE.

DIRECT CURRENT MOTORS
Adjustable and Constant Speed
(Suitable for MILL and STANDARD DUTY)

Qu.	HP	Make	Volts	R.P.M.
1	3000	G.E.	600	90/180
2—N-*	3000	Whse.	600	600
2—N-*	2700	G.E.	415	280
1—N-*	2500	Whse.	700	108/162
1—N-*	2200	Whse.	600	92/132
2—N-*	2000	G.E.	350	230/350
2—N-*	1750	G.E.	600	200/300
1— *	1500	Al.Chal.	600	120/240
3—N-*	1500	Whse.	600	300/700
2—N-*	1400	G.E.	250	165/300
6—N-*	750	Whse.	250	300/700
1	750	Whse.	250	200/400
2— *	650	S.&S.	300	1000/1350
2	600	Al.Chal.	600	300/600
1	600	Whse.	250	110/220
2	300	Whse.	230	300/600
2	235	Whse.	230	325/975
1	150	Whse.	230	400/1200
1	125	Whse.	230	450/1050
3	125	Whse.	230	350/1125
1—N-*	100	Whse.	250	350/700

N—New and unused.
*—Enclosed forced ventilated.

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Cable Address
"Macsteel" Philadelphia, Pa.
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Davenport 4-8300

THE CLEARING HOUSE

Activity Is Down In Cleveland Area

Used machinery dealers in the Cleveland area say business dropped as much as 50 pct in the first half.

It appears now that the prediction of good late summer business will not come true.

▪ Used machinery dealers with full balanced inventories are still doing business in the Cleveland area. But the activity has dropped off as much as 50 pct during the past six months.

Good machinery is still bringing high prices at the auctions. However, second rate units arouse very little interest. Alex Altfeld, Elyria Belting & Machine Co., sums up the current used machine picture this way:

"We find that firms are now making do with the machines they have in the shop rather than put out any money for more machinery." The veteran machinery dealer also notes, "Their volume is so low now, they won't make or lose much either way. So they're using the machines they already have in the shop to do many jobs for which they're not the best suited."

Shears and Brakes—Most of the activity reported by Mr. Altfeld is in shears and brakes for stamping plants.

"These have been tight for about two or three years around here and hardly any of the dealers have very many around. We can easily sell all we can lay our hands on. But, right now we're about cleaned out of them as are most other dealers."

Half the Cost—The Ohio company is an historic firm in the area dating back to the days of the line shafts when belting was a major item. It originally did far more business in replacing belting than in machines. However, the picture has changed with the times. Elyria Belting also operates a factory supply house and a scrap operation.

Optimism Gone—In many instances among used machine dealers, the optimism of a month ago is disappearing. With a "bad" first half, dealers had hoped, and predicted, good business in the late summer. But the general picture now fails to show this upswing.

Most used machine buyers have already placed their orders and the chances of additional business on a large scale are slim. Some dealers were looking for numerous government contracts to follow the political conventions. This could still become a reality.

ONE WAY
AS Habbick

The IRON AGE

VARIABLE VOLTAGE DRIVES

3 PHASE 60 CYCLE

Quan. Size Description

2—3000 HP DC MOTORS—525 V. 600 RPM Whse. M. G. Sets—2500 K.W. Whse., 2300/4160 V.

1—2750 HP DC MOTOR 450 V. 300 RPM Elliott 2200 K.W., Gen. Elec. 3 unit 450 V. DC Gen. with 3000 H.P. 720 RPM, 2300 V. AC Motor and Etc.

1—2250 HP DC MOTOR 600 V. 400/500 RPM, G.E. M.G. Set—2000 K.W. G.E. AC Motor—2300 V.

1—1500 HP DC MOTOR 600 V. 600 RPM Whse. M. G. Set. 1500 K.W. G.E. 13,200 V.

1—1500 HP DC MOTOR 600 V. 300/700 RPM Whse. M.G. Set—1500 K.W. G.E. 13,200 V.

For listing of Motors, Generators, Transformers, M.G. Sets, Rectifiers, Mill Motors, etc.

See last week issue.

Write — Phone — Wire

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ROLLING MILLS—STEEL WORKS EQUIPMENT

1—3-HIGH PLATE MILL 40" & 26½" x 112".
1—34" & 22" x 112" PLATE MILL, 3-high.
1—25" & 42" x 66" HOT STRIP MILL, 4-high.
1—3½" & 8½" x 5½" STRIP MILL, 4-high.
2—28" 3-HIGH ROLL STANDS.
1—18" 3-HIGH BAR MILL, single stand.
1—NEW 16" BAR MILL, 3-high, single stand.
1—10" BAR MILL with motor and gear drive.
1—9" BAR MILL 3-high five stands.
1—16" x 28" COLD MILL, 2-high, with 200 HP motor and gear drive.
1—34" x 192" ROLL GRINDER.
1—450 TON DOWN-CUT CROP SHEAR, 14" stroke. length of knives 28"
1—OPEN SIDE BAR SHEAR Williams & White No. 14½, 1¾" round.
1—SHEAR, 1" x 110" plate.
1—LEVELLER, 1" x 104" plates.
1—ELECTRIC MELTING FURNACE, 1-ton capacity 800 KVA transformer.
1—ROLL LATHE, ENCLOSED HEADSTOCK, up to 40" dia. rolls.
1—MAGNETIC SEPARATOR double pulley, Stearns.
1—SIDE TRIMMER, Streine, maximum width 48" makes 2 cuts 3/16" mild steel.
1—HALLDEN STRAIGHTENING and cutting-off machine, capacity 5/16" to ⅝" dia. x 14 ft.
1—POINTER, tube 2" O.D. x ¼" wall maximum.
1—1500 HP GEAR DRIVE, 7.5 to 1 ratio.
1—1200 HP GEAR DRIVE, 295 to 30 RPM.
1—1200 HP GEAR DRIVE, 353 to 94.5 RPM.
1—600 HP GEAR DRIVE, 1,698 to 1.
1—400 HP GEAR DRIVE, 8.2 to 1.
1—800 HP MOTOR, 2300 volts, 3 phase, 60 cycle, 293 RPM.
1—600 HP MOTOR, 2300/4600 volts, 3 phase, 60 cycle, 450 RPM.
1—400 HP MOTOR, 440 volts, 3 phase, 60 cycle, 450 RPM.
1—400 HP MOTOR, 2300/4600 volts, 3 phase, 60 cycle, 450 RPM.

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POORMAN - STREINE

12 Ft. x 10 Ga. Capacity
Replaceable Segment Dies
Feed Table
Good Operating Condition

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Will Lease or Furnish Long Terms

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5' x 12 Ga. Whitney Power Shear.
No. 3 Niagara Angle Bending Roll, M.D.
6' x 12 Ga. Wysong & Miles Power Shear.
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600 Ton Southwark Hyd. Inclined Wheel Press.
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BRIDGE CRANES

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2765 PENOBSCOT BLDG. DETROIT, MICH.
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HENRY & WRIGHT 150 TON CAP.

DIEING PRESS 3" Stroke 1947
Dble. Roll Feed; Scrap Cutter
30 HP 220/3/60 Varidrive Motor
Available: 50 Ton H & W and
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Surplus Equipment & Inventories Purchased

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DIESEL LOCOMOTIVES & CRANES

25-ton Industrial Loco. Crane, 60' Boom
12 Gen. Elec. 23, 25, 44, 65 & 80 Ton Diesel Elec. Locos.
2—65 Ton Whitcomb, 1—115 Ton GM & 2—100 Ton Gen. Motors

STANHOPE 60 E. 42nd St., N. Y. 17, N. Y.

WANTED

2 or more No. 57 Toledo Trimming Presses with side shears, or similar machines

#0 and #10 Waterbury Farrel Inclined Automatic Thread Rollers

Donahue Steel Products Company
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eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

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9/16" Cleveland Model A, m.d., 1943
1½" Foote-Burt Single Spindle, m.d., 1943
4 spindle 1⅝" Cleveland, Model M, m.d.
4 spindle 2" Model K Cleveland, m.d.
2½" Cleveland, m.d., Model A
3¾" Cleveland Model A Single Spindle, m.d., late
5½" Cleveland Model A, single spindle, m.d.
No. 4D Potter & Johnston, m.d., late

BOLT THREADERS
Victor Nut Facing Machine, m.d., cap. ⅜" to 2" nuts
1½" Landis 2 spindle, m.d.
1½" Landis Bolt Threading Machine, double head stay bolt, m.d.

BOREMATICS
No. 44 Heald Facing Type Borematic, m.d.
Model DB-102 Excello Double End Boring Machine, m.d.
No. 47A Heald Single End Borematic
No. 49 Heald Double End Borematic, m.d.

HORIZONTAL BORING MILLS
No. 41 Lucas Horizontal Table Type, m.d.
2½", bar, Model 25RT Giddings & Lewis, table type
3½" bar Cincinnati Gilbert Horizontal, Boring, Drilling & Milling, floor type
3⅛" bar, No. 32 Giddings & Lewis Table Type, m.d.
4" bar Universal Horizontal Table Type, m.d., late and good
4" bar, No. 42 Lucas Horizontal Table Type, m.d.
4½" bar, Model 72, Niles-Bement-Pond, m.d.
5½" bar Niles-Bement-Pond, m.d.
6" bar Sellers Floor Type, m.d.
Barrett Double End, 5" and 7" spindle, m.d.

VERTICAL BORING MILLS
16" Bullard Mult-Au-Matic, m.d.
24" Bullard Spiral Drive, m.d., 1944
36" Bullard, m.d., late 1944, Spiral Drive
36" Bullard New Era, m.d.
42" Bullard, Spiral Drive, m.d.
42" King, m.d.
44" Putnam, m.d., p.r.t.
53" Niles Heavy Pattern, m.d., p.r.t.
54" Bullard New Era, m.d.
60" Bullard, m.d.
84" Cincinnati H.D. Hypro, m.d., p.r.t., late
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3 LEE WILSON RECTANGULAR BELL-TYPE ANNEALING FURNACES

atmosphere-controlled with 9 bases, are available. Each is approximately 7' x 7' x 14'. Excellent when used for manufacture of steel coils, they have a capacity of 50 tons per charge. These top-grade furnaces are still set up in the plant. Tremendous values specially priced for prompt sale.

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First Class Condition

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Bed 16′ x 12′—Stroke 5′—Day 1.9′
4 columns 24″ diameter—
Two 350 HP Motors & pumps.
Details—Print on request.
Fraction of new cost.
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MONEY BACK GUARANTEE

1300-Ton Nat'l. Maxipres, 80 SPM, 10″ Str., 1955
920-Ton Toledo #60, Bed 47x72, Str. 20″, 1943
700/390-Ton Toledo #797E, Bed 127x83, Dbl. Act. Toggle, Air Clutch & Cushion
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440-Ton Bliss #210, Bed 37x36, 35 SPM, Side Shear, Str. 16″, Mfg. 1953
440-Ton Toledo #59¼, Bed 41x48, Str. 12″
255-Ton Toledo #58½B, Bed 43x42, Str. 12″
150-Ton Cleve. 60-D-84, Bed 86x46, Str. 14″
3000# Chambersburg "Ceco Drop" Hammers, 1951

NEW RADIAL DRILLS

4½′x15″ MAS-VR4A #4MT, 2500 RPM, Preselection, Hyd. Clamping, program control.
12′x26″ MAS-VR103, #6MT, 9′ Vert. Cap 5″, Hole cap., 20 HP 1400 RPM

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25 & 45 Ton G. E. Diesel Electric Locomotives
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#5 Waterbury Farrel Rotary Swager, 7½ HP motor, two die, rotating type. Address all replies

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THE PATTERSON FOUNDRY AND MACHINE COMPANY
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WHITING 10 ton cap. electric melting furnace. New 1953.

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30 Gauge Tinplate Circles, 5¾″ diameter
28 Gauge Cold Rolled Circles, 6″ diameter

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in any quantities
OF SURPLUS—NEW & USED
Structurals—All Types of Steel
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WANTED TO PURCHASE—any quantity

CARBON—ALLOY—STAINLESS

Bars—Billets—Sheet—Plate

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NEW *WANTED* USED
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BRIDGE CRANES
ARNOLD HUGHES COMPANY
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

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600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventory
39 Years of Steel Service

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DROP FORGINGS

Special Forgings of Every Description.
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AS CAST OR MACHINED.
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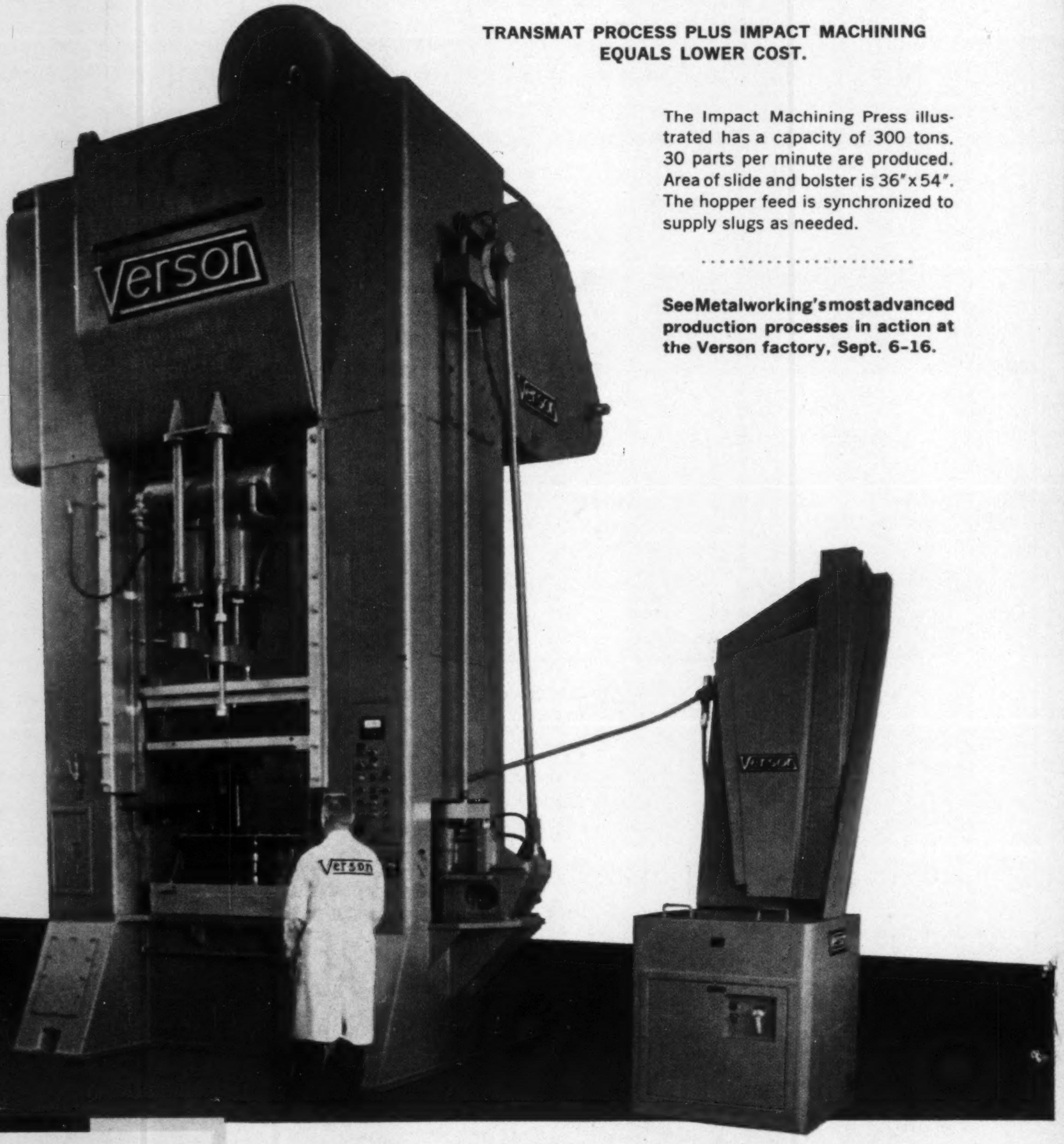

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